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PART FIRST.

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Review I.

1. *The Physiological Anatomy and Physiology of Man.* By Robert Bentley Todd, M.D., F.R.S., Fellow of the College of Physicians, Physician to King's College Hospital, and formerly Professor of Anatomy and Physiology in King's College, London; and William Bowman, F.R.S., Fellow of the College of Surgeons, Surgeon to King's College Hospital, and formerly Professor of Anatomy and Physiology in King's College, London. With numerous Illustrations on Wood.—*London,* 1843–1857. Two vols. 8vo, pp. 448, 660.
2. *Human Physiology.* By Robley Dunglison, M.D., LL.D., Professor of the Institutes of Medicine in Jefferson Medical College, Philadelphia, Vice-President of the American Philosophical Society, &c. &c. With 532 Illustrations. Eighth Edition, revised, modified, and enlarged.—*Philadelphia,* 1856. Two vols. royal 8vo, pp. 729, 755.
3. *Human Physiology, Statical and Dynamical; or the Conditions and Course of the Life of Man.* By John William Draper, M.D., LL.D., Professor of Chemistry and Physiology in the University of New York. Illustrated with nearly 300 Wood Engravings.—*New York* and *London,* 1856. Royal 8vo, pp. 649.

It was some years ago remarked to us by an eminent Swedish Professor, whose high scientific attainments and truthfulness of character, together with his extensive acquaintance with the medical literature of England, France, and Germany, gave peculiar value to his opinion, that, for the purposes of *teaching,* he esteemed no books so highly as ours. Were we asked to name any single treatise pre-eminently distinguished by this kind of excellence, we think that we should not have much hesitation in naming the one standing first on our list, the recent completion of which is not the least noteworthy event in the *annus medicus* just concluded. In the older treatises on Anatomy, the actions of the parts whose structure is described are for the most part systematically excluded; whilst in contemporary treatises on Physiology, we find the actions of organs described with as little reference as possible to their structure. A little Physiology was gradually forcing its way into treatises on Anatomy, whilst Physiological treatises were becoming more and more Anatomical; the old course of "Anatomy and Physiology" in University College (which institution was speedily followed in this change by other principal Metropolitan Schools) had given place to one of "General Anatomy and Physiology," in which only such parts of ordinary descriptive Anatomy were taught, as were directly subservient to Physiology; but no attempt had been made either in this or in any other country, so far as we are aware, to carry this improvement into literature, and to break down the barrier which had so long kept apart two subjects having the most intimate relations possible, until Messrs. Todd and Bowman produced the first part of their "Physiological Anatomy and Physiology of Man."

Not only was the work novel in plan, but also in a most important part of its materials. The improved powers which the Microscope had acquired not many years previously, had already been turned to most valuable account in the investigation of the *minutiæ* of Animal organization; the researches of Schwann, Henle, Valentin, Wagner, and other continental observers had opened up many new paths of inquiry; and it had become obvious that fresh and yet closer bonds of union would form themselves between Anatomy and Physiology, when vital activity, reduced by analysis to its most elementary manifestations, could be traced to the instrumentality of the most elementary forms of organic structure.

It was from the first evident that it was especially in this department that the Authors of the "Physiological Anatomy" were most successfully exerting themselves to extend the boundaries of their science by original inquiry. Mr. Bowman, in particular, had already acquired the highest credit as a minute Anatomist by his researches on Muscular Fibre, which were followed at no distant period by his brilliant discoveries as to the structure of the Kidney. And whilst availing themselves of the contributions of Chemists and experimental Physiologists in building-up the superstructure, it seems to have been their determination that this fundamental portion of their work should be executed by their own hands alone, and that they would state nothing on this subject but what their own eyes had verified. It is to this determination, in itself a most laudable one, that the long delay in the completion of the work is attributable,—a delay which must have been a source of regret and annoyance to many a student, and of which the public has not been unreasonable in complaining. When the first part was published in February, 1843, it was announced that the remainder would appear in two more parts in the course of the following year; and we have no doubt that the book was purchased by many on the faith of this pledge. More than two years elapsed, however, before the second part made its appearance; and it was then announced that two more parts would be required to complete the work, which parts were to follow at an early period. The two parts have grown to three; the "early period" has extended to nearly twelve years. The student who purchased the first volume of "Todd and Bowman" for his text-book, has long since left the schools; and, if tolerably successful in practice, has probably lost much of his interest in everything whose practical bearing is not at once obvious to him. And, what is perhaps the worst consequence of the delay, the earlier portions of the book had already become antiquated, before the later made their appearance; so that the production, taken as a whole, makes us think of how a lady would look if attired in the large bonnets of one epoch, the balloon sleeves of another, and the ample skirts of the present fashion.

Our Authors make the best apology that circumstances admit, in referring to the absorption of their time by engagements of another description. Every one knows that Dr. Todd has rapidly risen into that eminence as a practising Physician, and that Mr. Bowman has no less rapidly attained that rank as a Surgeon, to which the talents and attainments of each most justly entitled him. But no man who is himself closely occupied by any department of practice, needs to be told that for the production of such a work as "Todd and Bowman," an amount both of time and of mental power is required, which its exigencies do not leave at his disposal. And we think it would have been much better, therefore, if our Authors had done ten years ago what they have been forced to do at last,—namely, commit the completion of the book to other hands, reserving to themselves only the direction, verification, and final revision of the labours of their coadjutors. We can sympathize, however, with the attachment they had formed for the product of so much toil; and with their desire not to run the risk of lowering it in the estimation of an appreciating public by a less worthy continuation. And we shall dismiss this part of our task with the expression of the hope, that the next author or authors who may publish a book in parts, will not commence their issue until the preparation of the whole is so far advanced, that its completion is not likely to be postponed by any save an extraordinary interruption.

As we have never given anything but a passing Notice of the 'Physiological Anatomy' at the time that its successive parts have appeared, we owe it both to the Authors and to the Public to make it the subject of that fuller review which it would receive if now making its appearance for the first time as an entire work. For it is due to the former that the value of their original contributions, as well as the peculiar excellences of the treatise as a whole, should be clearly pointed out; whilst it is but fair towards the latter that its defects should be criticised, and especially that the imperfections resulting from the antiquation (if we may venture to coin such a word) of its earlier portions should be noticed. That we may not be thought to manifest a carping or ungenerous spirit in following this course, we would say *in limine* that with scarcely an exception, every part faithfully represented the ripest knowledge of the period at which it was issued, besides adding considerably to the amount of that knowledge. But we must look at the work as it now stands; and shall have to consider how far, as a complete whole, it falls behind the Physiological Anatomy and Physiology of the present day.

The Introduction, designed to place the Student of the Organization and Life of Man at his right starting-point, and to indicate to him the path which he may most surely follow, sets forth those general considerations with which most Physiological treatises open, as to the peculiarities of Organized structures and of the Vital actions they exhibit. The bygone doctrine of a Vital Principle, with the "Organic agent" of Dr. Prout, receive a passing shot; and the position is laid down (p. 15) that—

> "Out of the same elements of which the Inorganic kingdom consists, God has created a series of material substances, which by their action and reaction with other physical agencies, exhibit, apparently in a spontaneous manner, the phenomena of Life, and manifest a series of peculiar forces capable of opposing and controlling the other forces of nature."

It would, perhaps, have been conducive to greater clearness, if the distinction between Matter and Force, Substance and Agent, had been more consistently preserved. The progress of thought on this subject, during the last few years, has marked out this distinction with great clearness in all that relates to the Inorganic world. The old doctrine of the "imponderables" has now given place in the minds of all but such as are still entangled in the web of musty traditions, to the doctrine of "forces." And these "forces" are not hypothetical entities, but are cognizable by every man's personal experience. For, when we determinately put forth a certain amount of nervo-muscular power in communicating or resisting Motion, we are conscious of the exertion; and as the force thus developed may be directly or indirectly metamorphosed into Heat or any other form of physical agency, the relation of each of the Physical Forces to our own sense of effort is definitely established. Now just as the pen which we are at present holding is perfectly passive in itself, and moves only as it is directed by our hand, so is all Inorganic matter inert save when put into activity by one or other of these powers. And that this is equally true of Organized bodies,—that they have *in themselves* no force or spring of action, but derive all their energy from forces external to themselves,—is now coming to be generally received as a fundamental truth of Physiological science; and we believe a clear exposition of it to be the surest basis of Physiological teaching. It needs but a very little alteration in the quotation we have just cited, and in similar passages elsewhere, to render them conformable to what we hold to be our present more advanced position; and we trust that in a future edition we shall not meet with the obscurity which is engendered by ranking "material substances" with "*other* physical agencies."

Further on (p. 25) we are told that "the prominent characteristic of animals is the enjoyment of *Volition* or *Will;*" and that as "we are conscious that, by a certain effort of the mind, we can excite our muscles to action," so "when we see precisely similar acts performed by the lower creatures, with all the marks of a purpose, it is fair to infer that the same process takes place in them as in ourselves." Now on this passage we have to remark that it is extremely likely to mislead the student, and to put him altogether on a wrong track. We quite agree with our authors that "precisely-similar acts" are to be attributed to the same springs of action in the lower animals as in ourselves; but the question is—what *are* these precisely-similar acts? —and on this point there has been a vast amount of crude and hasty generalization. Thus the Hydra has been described as *voluntarily* waving about its arms in search of prey, as purposively bringing one tentacle after another to the assistance of whichever has been fortunate enough to entrap a worm or a water-flea, and then as combining the energy of all in dragging the luckless victim to its voracious mouth. More than this, it has been complimented upon its moderation, because, when its stomach is once filled, it does not, like too many human gluttons, endeavour to gorge further, but allows its contracted tentacles to be touched by all sorts of living dainties without making the slightest effort to entrap them. Now the fact is, as every Microscopist knows, that the body and arms of the Hydra, carefully as their substance has been scrutinized, afford not the slightest indication of nervous texture, but in the simplicity and homogeneity of their substance present a much closer resemblance to the lower forms of vegetable organization. Again, the body of the Hydra is essentially a stomach; and its so-called "arms" are like an œsophagus slit-down into strips. The contractile tissue of which they are composed, therefore, if likened to any part of the human organism, can only be legitimately compared to the non-striated fibre which forms the muscular wall of the stomach and œsophagus; and its movements, if really to be assimilated to anything which takes place in Man, should be likened to the peristaltic contractions of that wall, which, if we could watch them, would probably be found to be no less *purposive* in their relation to the acts of ingestion and digestion than are the actions of the Hydra. Looking, then, on the one hand, to the general homogeneousness of structure and to the absence of any perceptible nervous system in the Hydra, and on the other to the fact that the operations of these parts of our own organism with which its body may be most legitimately compared, are performed not only without any exertion of the will, but also without consciousness, it seems to us a pure assumption to endow this creature with attributes that are the peculiar distinction of Man and the animals that most nearly approach him in organization, merely on account of a superficial resemblance which altogether disappears when closely scrutinized. We believe that a careful study of the structure and actions of Animals, following the ascending series, and taking the purely automatic movements of Plants as our basis, would show that in the lower forms of animal life the greater part, if not the whole, of the motor activity is of the same kind as that of Plants,—the contractions which give rise to it being either dependent (as in the case of ciliary movement or of other rhythmical phenomena) upon the succession of vital changes taking place in the tissues themselves, or being the result of external stimulation directly applied to the motile parts. So soon as we can clearly discern the existence of a nervous system, we can recognise motions depending upon stimulation conveyed through it; but these motions have all the characters of "reflex" or "excito-motor" actions, and cannot be regarded as certainly indicative even of Consciousness, much less of Will. It is only when organs of special sense begin to make their appearance, and the movements of the animal begin to manifest the influence of their guidance, that we can predicate with any certainty the presence of the former of these endowments; and this by no means justifies us in assuming that it is accompanied by the latter. For of the actions which are guided by sensation, even in ourselves, it is quite certain that many are not directed by volition, but belong to that part of the "instinctive" series which has been designated "sensori-motor;" and a careful comparison of the actions of Insects and other Articulated animals with our own, would seem to show that with very little exception those which are not simply-reflex belong to this category. And even when we study the lives and habits of Vertebrated animals, and compare the manifestations of Mind in them with those not of the *adult* but of the *young* of Man, we find reason to believe that even where Intelligence and Emotion are unmistakeably manifested, there is not always distinct evidence of Volition; that the highest condition of the brute does not approximate in this particular to that which is pre-eminently characteristic of Man; and that in the power of directing and controlling his own current of thought and action by a power within himself, which can (when adequately developed) overmaster the promptings of appetite, the impulses of passion, or even the suggestions of intelligence, he stands alone among all terrestrial beings. That power, and that alone, in our apprehension, is *Volition;* and to speak of it as appertaining to the Animal kingdom generally, shows an indefiniteness in the use of terms, or a want of clearness in the writer's ideas, either of which can scarcely exert any but a misleading influence. Our remarks apply to other passages than the one we have cited. Thus a little further on (p. 26) we find it stated that "a power of perception and a power of volition together constitute our simplest idea of *Mind.*" Where, we would ask, is either perception or volition in the state of Dreaming; or in those states of natural or artificial Abstraction or Reverie, which are allied to it in the entire suspension of volitional control over the current of thought, and of the perceptive recognition of what is taking place in the outer world? Yet surely our authors would not affirm that the succession of ideas and feelings characteristic of these states is anything but *mental.*

We now pass from the Introduction to the First Chapter, which is concerned with the proximate constituents of Animal bodies. Under this head we have a concise view of the Chemical composition of the tissues, which, though correct enough at the time it was written, would now require considerable modification. It would lead us into too wide a discussion were we to enter upon this part of the subject, which is, moreover, in such a transition state that no position can be assumed to be of more than temporary value; but we would cite, as illustrations of the changes which fourteen years have made, (1) the general abandonment of the notion that the *fibrine* of the blood forms the basis of the muscles; and the converse idea entertained by many physiologists and pathologists (to which, however, we are not ourselves yet converted) that this substance is in a state of retrogressive not of progressive metamorphosis: and (2) the general agreement in the belief that *gelatine* is not an organizable substance, and is therefore useless as histogenetic food, the tissues which yield it on boiling being generated only at the expense of the albuminous principles. As this chapter was written soon after the promulgation of the Cell-theory, when the doctrine of Schwann held undisputed sway, the development of *all* the animal tissues from cells is taught as a fundamental fact. As regards the simple fibrous or connective tissues, however, this doctrine was very early called in question; and it may now be considered as a well-established fact, that cell-development is not a necessary phase in their production. The tendency of recent inquiry has undoubtedly been to extend this view to other structures; and it may be pretty certainly stated that the cell is only one out of several elementary forms of organization, into which an organizable blastema may evolve itself.

Commencing with the Locomotive function, our authors first discuss the minute movements occurring in the interior of the body; and it is interesting to remark how true an appreciation they had formed of the nature of ciliary movement, and of the character of the spermatozoa, at a time when the general opinion on both these points was far from correct. Physiologists had been so long in the habit of regarding all animal motion as muscular, that few of them could conceive of ciliary action in any other light; and the doctrine was gravely promulgated by high authorities, that each cilium had a set of muscles inserted into its base, by the contraction of which its motions were effected. To say nothing, however, of the fact that the cilia are usually themselves far more minute than the ultimate elements of the finest muscular fibrilla, their essential connexion with epithelial cells, and the continuance of their movements when the muscles have lost their contractility after death or have been temporarily paralysed by the suspension of their supply of blood, are justly regarded by our authors as proofs of their independent motile power. And further research has fully borne out this view, by showing on the one hand that ciliary action is a very common phenomenon among the lower plants, in which muscles could not be supposed to exist; and on the other that each cilium is in reality a part of the cell to which it is attached, and shares its vital endowments. It is one of the most interesting results of recent physiological inquiry, that even the common *Volvox globator*, so long known under the name of the "globe-animalcule," is unquestionably to be ranked among vegetables, and that the cilia to which its active movements are due are filamentous prolongations of its cells, as they can be shown to be also in many other organisms of analogous simplicity. And a like extension of our knowledge in regard to the spermatozoa, has fully justified the analogy of their movements to those of cilia which was propounded by our authors, at a time when Ehrenberg and other high authorities maintained that they were independent animalcules, Valentin even professing to discover in them a mouth, anus, and digestive cavity. For it is now known that bodies of this kind are found not only in the seminal fluid of all animals, but also in special organs belonging to the greater number of Cryptogamic plants; that each is developed within a cell of the testis or antheridium, by the bursting of which it is set-free when mature; and that the spermatozoa of Animals and the antherozoids of Cryptogamia must be regarded, therefore, not as parasites, but as products of their respective organisms, specially endowed, like cilia, with motor power, whereby they may be brought into contact with the germ-cells, and may thus be enabled to perform their peculiar part in the generative act.

The organs of locomotion are next considered, under the two heads of *passive* and *active;* the former category including the fibrous tissues with the osseous and cartilaginous skeleton; the latter comprehending the muscular and nervous tissues. The most noticeable part of our authors' description of the fibrous textures, is their account of the Areolar tissue (previously known as "cellular" or "connective" tissue), and their demonstration that it had not, as formerly supposed, an elementary structure peculiar to itself, but that it is a combination of two elements which elsewhere exist separately, namely, the white and the yellow fibrous tissues. It was by them, we believe, that the simple expedient was first devised of discriminating the two tissues by the addition of a drop of dilute acetic acid, which swells-up the white fibres and renders them transparent, while it produces no change in the yellow; so that the minutest threads of the latter, which were previously obscured by the predominance of the other element, now become plainly visible. By them, too, the true office and distribution of this tissue were first clearly pointed out. · Vague and sweeping statements of its universal prevalence throughout the organism were current in Anatomical and Physiological treatises. It had been said to enter into the composition of bones and cartilages, as well as of muscles, nerves, and glands; and some had even affirmed that if every other tissue could be abstracted from the human body, each part and organ would still be represented by a sort of framework of "cellular" tissue. It was shown by Messrs. Todd and Bowman, however, that the interposition of areolar tissue amongst the component parts of the organism is for the connexion of those parts with each other, in such a manner as to allow a greater or less freedom of motion between them; and also to fix in their proper places the bloodvessels by which those parts are supplied. "So true and comprehensive," as they justly remark, "is this association of the areolar tissue with the vascular, that it would be difficult to point out a single instance in which one office of the former is not to envelope and protect the latter." Hence it is the muscles that we find to be the most uniformly penetrated by areolar tissue; whilst in such parenchymatous organs as glands, the quantity of this tissue that is present appears to be very closely related to the mobility which is required to exist among their component parts. This is well illustrated by the following contrast:—

> "The *liver* is well screened from injury by its position; it is liable to no change of bulk; it consists throughout of a continuous and close network of capillaries, the interstices of which are filled by the nucleated secretion-particles. The lobules resulting from the distribution of the vessels and ducts blend together at numerous points, and have no motion on one another. Here the areolar tissue is in very small quantity, and is limited to the ramifications of the vessels and ducts. The *mamma*, on the other hand, is, by its situation, particularly obnoxious to external injury. It is broken up into numerous subdivisions, which move with the utmost freedom on one another; and it is moreover liable to temporary augmentations of bulk. In this important gland, there is not only a common investment of peculiar density, but an extraordinary abundance of areolar tissue disseminated through its interior." (p. 78.)

Thus, as they justly remark, this tissue is to be regarded as rather taking a subordinate or ministering share in the constitution of the frame, than as being of primary importance in itself. Moreover, it is by no means uniform in its composition; for where great elasticity is required, the yellow element preponderates; while the white fibrous element abounds in parts demanding tenacity and power of resistance. And this difference, as our authors have elsewhere shown (p. 406), is strongly marked in the substance of the true skin; yellow fibres, disposed in an open network, being very abundant in those portions where great extensibility and elasticity are required, as in the skin of the axilla; whilst the inelastic white element, woven very closely together, is the material chiefly employed where simple resistance is required, as in the skin of the sole of the foot. They truly point-out that there is no definite boundary between the true skin and the subcutaneous areolar tissue; the fibrous matrix of the former being (as is well seen in vertical sections) perfectly continuous with the latter; and the difference essentially consisting in the condensation of the texture of the skin, and in the peculiar distribution of its blood-vessels, nerves, and lymphatics, whilst in the subcutaneous tissue there are large areolæ which are commonly filled up by clusters of fat-cells. The frequency of the association between the areolar and the adipose tissues leads our authors to describe the latter, like the former, among the "passive organs of locomotion;" we certainly should not have expected to find the description of fat under that head, the notions of fat and locomotive activity being commonly considered rather antagonistic; but we must admit that in the general scheme adopted by Messrs. Todd and Bowman, it would have been difficult to find a more appropriate place.

We need not dwell upon the chapter in which Cartilage and Fibro-Cartilage are described, since, although obviously the result of careful investigation, it is not distinguished by any particular originality, and would not require any important addition or modification to make it fully conformable to the present state of knowledge.

Arriving now at Bone, we have much to remark upon. In the first place, it is highly creditable to our authors, that their account of the minute structure of bone should have been so excellent and complete that little could now be added to it with advantage. At a time when the dark spots with radiating threads seen in a thin section were commonly regarded as solid "corpuscles" peculiarly charged with calcareous salts, they boldly avowed their conviction that these spots instead of being solid were vacuities excavated in the solid osseous substance, and that the radiating threads were delicate tubes; and we owe to them the suggestion of the names *lacunæ* and *canaliculi*, by which these cavities and their prolongations have ever since been commonly known. The composition of the shaft of a long bone, as made up of a bundle of Haversian "rods," each having its own system of concentric lamellæ arranged about the Haversian canal, was more clearly stated by them than it had been by any other histologist; and they would seem, from one of their figures, to have narrowly missed the subsequent discovery of Messrs. Tomes and De Morgan, that the portions of osseous tissue which in the adult bone fill up the interspaces between the Haversian rods, are really nothing else than residual fragments of antecedent Haversian rods which have for the most part undergone absorption to make room for new rods in course of development. The relations of the different parts of the vascular apparatus of bone, and the essential non-vascularity of the osseous tissue—which everywhere lies *outside* of the involutions of vascular membrane derived from the external surface,—are very clearly stated by our authors. The principal error that would now require correction is in the account of the animal basis of bone, which is said to consist of *cartilage*. This, no doubt, has long been, and still is in the minds of many, the orthodox doctrine; but we hold it to be quite unfounded. The superficial resemblance to a piece of cartilage, which the decalcified bone *en masse* presents, entirely disappears when its minute structure is examined; for we find in it neither cartilage-cells nor chondrinous intercellular substance, but on the other hand a laminated matting of indistinctly-fibrous texture that yields gelatine on boiling, and bears more resemblance to the white fibrous tissue than to anything else. This fact, first pointed out (we believe) by Professor Sharpey, is of fundamental importance in the histology of bone; and it is difficult to account for its having been so long overlooked. It may be readily demonstrated by decalcifying a piece of bone in dilute muriatic acid, then macerating the animal residue for some time in water so as to remove the acid (which otherwise leaves the fibres swollen-up and indistinct), and then tearing it into the thinnest possible shreds, a microscopic examination of which shows imperfectly differentiated fibres crossing one another diagonally, often having in their interspaces minute pores, which seem to be transverse sections of the canaliculi, and now and then showing a wide opening which was occupied by one of the osseous lacunæ. We have known the opinion of one of the first histologists of the day asked upon such a shred; and he pronounced it unhesitatingly (being ignorant of its source) to be white fibrous tissue. This fact is still by no means generally recognised; we hope that the attention we have drawn to it may help it to become so.

In their account of the development of Bone, our authors seem to have been much influenced by the erroneous idea to which we have just referred, as to the cartilaginous nature of the animal basis. They limit their description to the cases in which bone replaces an antecedent cartilaginous matrix, and do not advert to the equally large number of instances in which the greater part of the ossifying process takes place in the substance of a fibrous membrane; the former being the method usually followed in the first formation of the long bones, the latter in that of the flat; the former, again, being the mode of longitudinal increase of the long bones, but the latter being the mode of their increase in diameter. Our authors were the first to give a minute account of the appearances seen at and near the ossifying surface of a temporary cartilage; and their description of those appearances is quite correct, though their interpretation may require modification. Thus they say that in the vicinity of the point of ossification "the cartilage-cells are seen to be gradually arranging themselves in linear series, which run down, as it were, towards the ossifying surface." The appearance of these linear series must be familiar to every one who has ever examined a vertical section of an ossifying cartilage; but we think that there can be little doubt that instead of the cells "arranging themselves" in this manner, their linear succession is due simply to the mode of their development. For near the plane of ossification, where the supply of blood is unusually great, they would seem to undergo the process of duplicative subdivision with great rapidity; and if this subdivision always takes place in the same direction (as in the growth of a Conferva) instead of alternately across and longitudinally (as cartilage-cells usually multiply elsewhere), a single file of cells will be produced. The absence of intercellular substance between the component cells of any row is an additional evidence to our minds that the series has been produced by a process of multiplication, and not by any new arrangement of cells previously existing.

Our authors state quite correctly that the ossifying process commences in the intercellular substance of the cartilage, so as to form a series of minute cancelli enclosing the extremities of the vertical piles of cartilage-cells; and that this first-formed bone is homogeneous and destitute of lacunæ or canaliculi. They also state that even in the complete bone, the Haversian rods may often be seen to be separated by thin laminæ of this primary osseous network. But they adopt a view of the growth of bone which we must unhesitatingly reject as erroneous. They believe that the primitive cancelli become Haversian canals; and that concentric deposits of bone take place around these canals *from within outwards;* so that each previously-formed cylinder is distended by the new one, and must adapt itself by interstitial growth to its increase of diameter, the primitive intercellular osseous network being itself distended in like manner by the expansion of its contained Haversian systems. This interstitial growth of bone is a pure hypothesis. There is no evidence whatever, that a lamina of bone once formed undergoes any subsequent change until it is removed by absorption. And we believe it to be capable of rigorous demonstration that the growth of bone is effected by additions to the parts already formed, this addition frequently involving also removal and substitution. Our authors seem to have overlooked the fact, that if a series of sections be made through the newly forming bone, at different distances from the plane of ossification, the minute cancelli which are seen in the latter situation give place to areolæ of much larger size, which areolæ are pretty obviously formed by the breaking-down of several cancelli into one another, the intervening osseous partitions having disappeared. That a process of this kind takes place in the formation of what is to become the medullary cavity, is not doubted by any one; its stages are exactly described by our authors; and what is true of it, is true also, we feel confident, of each Haversian system, the medullary cavity being nothing else than an enlarged Haversian canal. It is on the walls of these large areolæ, not on those of the original minute cancelli, that the first deposits of true osseous lamellæ take place; and these deposits are formed *from within outwards*, the large irregular spaces at first occupied by the bloodvessels and formative blastema being gradually contracted by these concentric formations, until, the Haversian system being complete, there is only space enough in the centre of it for the vessel which occupies the canal. Thus it comes to pass that in the young bone the proportion of organic to mineral matter is much greater than in the old; for while there is every reason to believe that the osseous substance itself is pretty uniform in its constitution, the areolation in the young bone is so much more open, that there is space in it for a much larger quantity of animal tissue. The progressive contraction of the Haversian systems by endogenous deposit is well seen in the antler of the deer; for in these the Haversian canals themselves are at last blocked up; and it is to this cause, not to the interruption to the circulation at its base, that the necrosis of this bone and its exuviation as a dead part are due.

It is affirmed by Messrs. Todd and Bowman that the formation of the true osseous texture which lines the primitive areolæ, is due to the calcification of cartilage-cells which arrange themselves on the inner surface of the cancelli, their nuclei remaining in a granular condition, and thus keeping spaces unconsolidated, which become the lacunæ. This view has been adopted by many other histologists, and there is much to be said in its favour. But even granting that bone may be generated by the calcification of the cells lying in the blastema that occupies the areolæ, we cannot see the evidence that these are cartilage-cells; to us they appear much more like a new production. And we think, with Professor Sharpey, that it is much more probable that the concentric lamellæ which constitute each Haversian system, are formed in the same manner as those which are generated on the surface of the bone, their intimate structure being precisely the same. That in both situations new "cartilage-cells" are in continual course of production, seems to us to be a gratuitous assumption; since they have neither the distinctive attributes of cartilage-cells, nor is their original descent from these capable of demonstration. The exclusiveness of their idea of the intra-cartilaginous development of bone, causes them to overlook the share which the periosteum has in its superficial increase. They affirm "that bone does not grow upon its exterior because the periosteum is there; and that the only part this membrane takes in the deposit of new bone is by the vascular network mingled with its fibrous tissue, and which does not differ from that on other portions of the osseous substance." In stripping off the periosteum from a bone, it not unfrequently happens that minute spicules of bone are detached and remain adherent to the periosteum; whilst on the other hand there is always a detachment of a portion of the fibrous substance of the periosteum, which is left on the surface of the bone. By the examination as well of the former as of the latter, we find ourselves forced to the conclusion that there is an absolute continuity of fibrous tissue between the periosteum and the subjacent surface of bone; and that the calcified basis of the latter is therefore homologous with the former. In a bone which is undergoing increase in its diameter, we find a considerable amount of organizable blastema between the periosteum and the surface of the bone; and in this we meet with cells very similar in appearance to those which lie in the blastema that occupies the cavities of the young Haversian systems. We are ourselves inclined to believe that either these cells or their nuclei are concerned in the formation of the lacunæ and canaliculi; but the osseous tissue through which these are distributed, seems to us, from the evidence afforded by its decalcified basis, to be undoubtedly formed by the consolidation of a fibrous tissue of gelatinous composition.—We by no means deny that true bone may be generated in various modes. Some of the appearances described by Messrs. Tomes and De Morgan* must be allowed to present strong evidence that it sometimes has its origin in the consolidation of cells; and indications of the same nature are afforded by abnormal osseous growths. But we think that the uniformly fibrous texture of the decalcified matrix of ordinary bone is the best evidence of the mode of its production; and that no theory of Osteogeny can be accepted, which is inconsistent with this fundamental fact.

The objection which we have already taken to our Authors' account of the expansion of the individual Haversian systems, applies also to their account of the growth of an entire bone. They describe this as not only taking place by addition to its surface and extremities, but also by interstitial addition, so that the shaft of a long bone swells as a whole,—a notion for which there does not appear to us to be the least foundation. The experiments of Duhamel which are cited in support of it, are fully explained on the universally admitted principle that a growing bone receives continual accretions on its surface, whilst its central cavity is enlarged by a continuance of that absorbent process to which it owed its origin. That even when a bone has attained its full dimensions, there is a continual change in its materials, would appear from the large number of facts collected by Messrs. Tomes and

* Philosophical Transactions, 1853.

De Morgan in relation to the replacement of old Haversian systems by new ones; but this process of interstitial substitution, which does not affect any part save that which is itself undergoing it, has no relation to the general dilatation advocated by our authors. Its continuance shows that bones are not exempted from that general law of limited duration, which seems to apply alike to the softest and most transient, and to the hardest and most durable parts of the organism; and it also serves to keep the nutrient processes in such activity, that they may be in readiness for any extraordinary exertion occasioned by the demand for reparation.

The Chapter on the Synovial Membranes, Serous Membranes, Varieties of Joints, and Mechanism of the Skeleton, contains little that calls for special notice. We may remark, however, that the folds of the synovial membrane projecting into the articular cavities, especially of the knee-joint, are spoken-of by our authors as having been *erroneously* imagined by Clopton Havers and other anatomists to perform a glandular office and to secrete the synovia. The extraordinary vascularity of these folds and the peculiar character of their epithelium, to which attention has been directed by Mr. Rainey since the opinion just cited was penned, are admitted by our authors in a later part of their treatise (vol. ii. p. 452) to justify Havers's speculation.

We now come to the Active organs of Locomotion, and first take up Muscular Fibre, whose structure and actions Mr. Bowman had most ably elucidated previously to the appearance of the 'Physiological Anatomy.' In fact the portion of the chapter which relates to this subject is essentially a reproduction of Mr. Bowman's admirable paper in the 'Philosophical Transactions.' Before the appearance of that paper, little was certainly known of the composition either of striated or of non-striated muscular fibre. It had been perceived that the striated fibre might be sometimes decomposed into fibrillæ; but it had been asserted by some that these fibrillæ are so aggregated as to form a hollow, not a solid cylinder; the question whether the alternating light and dark striæ are due to some superficial impression, or whether they extend through upon the whole substance of the fibre, had not been positively decided; and the distinctness of the sarcolemma from that which it invests had not been clearly made out. We believe it to have been by Mr. Bowman that the sarcolemma was first plainly discriminated from its contents; that these contents consist of minute particles or "sarcous elements" which adhere to one another both longitudinally and transversely; that when the longitudinal adhesion is the stronger, the substance of the fibre can be separated into fibrillæ, in which the sarcous elements are joined end to end, and of which every one presents an alternation of light and dark spaces, corresponding with the striæ of the entire fibre, whilst, if the lateral adhesion be the stronger, the fibre may be cloven transversely into disks, in which the sarcous elements are arranged side by side like corks within a hoop. By later observers it has been rendered probable that these "sarcous elements" are minute cells, and that the alternation of light and dark spaces is really the alternation of cell-walls and cell-contents, each light space being subdivided by a fine line which seems to mark the separation between the walls of two contiguous cells. But nothing else can be said to have been added to our knowledge of the structure of striated fibre since the date of Mr. Bowman's Memoir. In regard to non-striated fibre, however, the case is different. Mr. Bowman described them as flattened bands, generally of a pale colour, bulged at frequent intervals by elongated corpuscles, similar to those of striped muscle, and capable of being brought into view like them by immersion in a weak acid. He expressed himself doubtfully as to the existence of a sarcolemma, but thought that the mottled granular aspect which these fibres often present might be due to an approach towards the structure of striated fibre, the granules representing the sarcous elements. It seems, indeed, as if he considered the non-striated fibre to have an organic arrangement essentially the same as that of the striated, but to be in a less advanced grade of development. The more recent researches of Kölliker, however, have completely altered our idea of the nature of non-striated muscle; for he has shown it to consist of cells, usually so much elongated as to present a fusiform shape, several of which adhere together side by side to form a single fibre of the kind described by Mr. Bowman. Various modifications of this tissue have been discovered by him in parts which were known to possess muscular contractility, although no muscular structure had been previously detected in them; the cells in many instances being but little elongated, and being then recognised chiefly by the long staff-shaped nucleus which they always possess. Although Professor Kölliker's statements upon this point have been called in question by several histologists both British and Continental, they have been confirmed by so many others that their general correctness may now be considered as established beyond dispute. One of the most recent and most trustworthy testimonies to this effect has been recently given by Mr. Joseph Lister to the Royal Society of Edinburgh. The portion of our authors' work, therefore, which relates to non-striated fibre, although conformable at the time it was written to the most advanced knowledge of the subject, now requires considerable modification.

We must not leave the subject of Muscle, without mention of the fact that it is to Mr. Bowman's researches that we are indebted for our knowledge of the mode in which the fibres shorten in contracting. Previously to these, the assertion of MM. Prevost and Dumas had gained currency, that the straight fibres become zig-zag; and however improbable it may now seem to us that they should exert any power of traction in this condition, yet the fact that such an arrangement unquestionably presents itself in some of the fibres of a contracted muscle, seemed to justify the conclusion. It was clearly demonstrated, however, by Mr. Bowman, that in the state of contraction the individual fibres, like the entire muscle, shorten and at the same time increase in diameter, their transverse striæ becoming approximated to each other; he also confirmed by observation an idea which had been considered probable on other grounds, namely, that in the ordinary contraction of a muscle, only a part of its fibres are in active operation at any one time, and that these speedily relax again, the contracted state being taken-on by others which were previously relaxed; and he satisfactorily accounted for the zig-zag arrangement, by showing that it is presented by fibres whose extremities are approximated by the contraction of *other* fibres, whilst they are themselves in a state of relaxation. He also demonstrated that not even the whole of even one fibre need be in contraction at once; the approximation of the striæ and the bulging of the fibre usually beginning at isolated points, and gradually increasing in number and extent until they engage its whole length; sometimes first oscillating in a sort of peristaltic manner, as if waves of contraction were passing from end to end, often interfering with one another, the larger overcoming the smaller. And he adduced, in confirmation of his account of the nature of the contractile action, the condition of the fibres in muscles which had undergone partial rupture in the tetanic spasm; the elementary fibres being here found to present numerous bulges of a fusiform shape, in which the transverse stripes are closely approximated; and these swellings being separated from each other by intervals of various lengths, in which the fibres have either entirely given way, or are more or less stretched and disorganized.

The chapters relating to the Nervous System are among the most valuable in the whole work. Though containing no brilliant discovery, they bear evidence both of a large amount of original research, and of clear and philosophical thought; and it is curious to observe to how great an extent subsequent inquiry has confirmed the opinions which were expressed by our authors with a caution and freedom from dogmatism which contrast most favourably with the rashness and assumption of more than one contemporary writer. Thus they were among the first, if not the very first, to trace out that connexion of the axis-cylinders of the nerve-tubes with the ganglionic vesicles, which has been since found to be a very frequent if not the constant mode in which the nerve-tubes terminate in the central organs; and they also suggested that some of the ramifying prolongations into which the caudate processes are occasionally seen to extend, serve to connect different vesicles with each other,—an idea which, though scarcely yet demonstrated, has received much additional confirmation. So, again, they unhesitatingly adopted the view that the vesicular matter is the source of nervous power, and that the function of the nerve-trunks is simply that of conductors; and although this is now so familiar to all physiologists that the student is led to receive it as among the unquestioned verities of the science, yet we must bear in mind that the time is not very long past in which this doctrine was considered purely speculative, the notion of Gall that the grey matter merely serves for the generation of the white having been current in many schools even within the last twenty years. We cannot clearly say who first suggested the doctrine now universally received; but we believe that the first distinct expression of it is to be found in Mr. Solly's treatise on the Brain, whilst a more formal and argumentative enunciation (which is quoted by Messrs. Todd and Bowman) was put forth by Mr. Grainger in his work on the Spinal Cord which followed at no distant date.

But the greatest proof of our authors' sagacity, is exhibited in their general theory of the operations of the nervous centres. Although the minute anatomy of the spinal cord had at that time been but very imperfectly investigated, yet they had been led to the conclusion, since so abundantly confirmed by microscopic research, that the spinal nerves terminate in part at least in the grey matter of their own segment, as affirmed by Mr. Grainger; but they had been also led to doubt the correctness of the doctrine, which had not up to that time been formally called in question, that a part of the roots of the spinal nerves are also in direct continuity, through the white strands of the cord, with the encephalon. Hence they neither adopt the older hypothesis that all muscular movements called forth through the cerebro-spinal nervous system have their origin in the brain; the grey matter of the spinal cord merely serving to enable the nerves of sensation which are on their course through it to excite to activity nerves of motion which are in their vicinity. Nor do they adopt Dr. Marshall Hall's doctrine of two distinct systems of nerves, the excito-motor and the sensori-volitional, one for the simply-reflex actions in which consciousness is not involved, the other for those which are the result of volitional determinations prompted by sensations; for to this complete arrangement it had been shown by Dr. Carpenter that a third system must be added, for the execution of those instinctive and emotional actions, which are excited through sensations and are therefore not reflex, but are independent of or even antagonistic to the will, and are therefore not volitional. But they propound the hypothesis (without laying claim to any originality in doing so, although we believe that at that time no one had anticipated them) that—

> "All the spinal and encephalic nerves, of whatever function, are implanted in the grey matter of the segments of the cerebro-spinal centre with which they are severally connected, and do not pass beyond them. The segments are connected with each other through the continuity of the grey matter from one to another, and through the medium of commissural fibres which pass between them. Through these means, motor or sensitive impulses are propagated from segment to segment; and a stimulus conveyed to any segment from the periphery may either simultaneously affect the brain and cause a sensation, or be reflected upon the motor nerves of that segment and stimulate their muscles to contract." (p. 323.)

According to this hypothesis, the immediate source of the change of condition of the motor nerves from the passive to the active state is always the same, whether the movement be what our authors designate (though we think not very appropriately) a "physical nervous action," or whether it proceed from any kind of mental change; and thus it may be the result of the prompting either of a sensation, an emotion, an idea, or a volition, according to the condition of the encephalic centres, and the psychical state of the individual. This doctrine is so ably sustained by a great variety of arguments, that we can only account for its not having gained more immediate currency, on the supposition that the minds of such physiologists as were inclined to give up the old doctrine, were for the time preoccupied by the ingenious hypothesis of Dr. Marshall Hall, confirmed, as it seemed to be, by the researches of Mr. Newport on the Anatomy and Physiology of the Articulata. Great as has been the attention of late years given to the structure and actions of the Spinal Cord, both by microscopic anatomists (among whom Mr. Lockhart Clarke must be named as pre-eminent in this department of research), and by experimental physiologists (of whom we would name M. Brown-Séquard as in our apprehension at once the most ingenious and the most trustworthy), we have found nothing to disturb and much to confirm our belief in the essential correctness of Messrs. Todd and Bowman's doctrine. The suggestion of it we regard as among our authors' most important contributions to Physiology; and we believe that the time is not far distant when the universality of its reception will cause its value to be everywhere appreciated.

We do not think that in their account of the Encephalon and its functions, Messrs. Todd and Bowman are as successful as in regard to the Spinal Cord; and we believe the reason to be, that they altogether ignore the assistance which Comparative Anatomy affords in the determination of the actions of its several parts. By this clue alone, as we conceive, can access be gained to a knowledge of the true relation of the Cerebrum to the independent ganglionic centres it overlaps and encloses; and thus alone can the mutual relations of the olfactive ganglia, the thalami optici, the corpora striata, the corpora quadrigemina, and the auditory ganglia, as collectively forming the apparatus of sensation (both special and general) and of the motions it directly prompts, be brought into view. Our authors, however, have assisted in developing these relations, by pointing out a very happy analogy which the corpora striata and the thalami optici respectively bear to the anterior and posterior horns of the grey matter of the spinal cord. They show strong ground from pathological as well as anatomical facts for the belief that the thalami optici are centres of common sensation, and the corpora striata centres of motor influence; and, as they justly remark—

> "The intimate connexion of sensation and motion, whereby sensation becomes a frequent excitor of motion—and voluntary motion is always, in a state of health, attended with sensation,—would *à priori* lead us to look for the respective centres of these two great faculties, not only in juxtaposition, but in union at least as intimate as that which exists between the corpus striatum and optic thalamus, or between the anterior and the posterior horns of the spinal grey matter." (p. 351.)

With this view of the seat of common sensation, it surprises us to find our authors, a few pages afterwards, putting-forth the hypothesis that the ganglia on the posterior roots of the fifth and spinal nerves bear the same relation to the sense of touch, that the corpora quadrigemina do to the visual sense. Putting aside the fact that anatomical inquiry seems to lead to the inference that these ganglia are really parts of the sympathetic system, and that experiment favours the belief that they exert some influence over the nutrition of the parts to which their nerves are distributed, we would ask what evidence there is that through the spinal cord and its nerves *per se* the consciousness can be affected by any external impression; and whether all the evidence of experiment and pathological observation does not tend to show, that it is only when the spinal cord is in connexion with certain encephalic centres that consciousness of an impression—that is, sensation,—can be excited. Comparative Anatomy seems to us to furnish abundant ground for the belief that the optic ganglia are the centres of visual consciousness; that is, impressions made upon the recipient extremity of the optic nerves, and transmitted to its central termination in the ganglia, excite in them a certain change, in virtue of which we become cognizant of the impression, that is, we see. And there is the same kind of evidence for the belief that there exists in some part of that ganglionic tract which lies at the base of the brain in man, a centre of common sensation, through which the consciousness is informed of impressions made upon any part of the body to which sensory nerves are distributed. If such be the office of the thalami optici, as our authors seem most distinctly to imply when they say that these organs "may be viewed as the principal foci of sensibility, without which the mind could not perceive the physical change resulting from a sensitive impression," what possible basis is there for the idea that this attribute is distributed among the spinal ganglia? We find that when the spinal cord is cut off from the encephalic centres, impressions made upon its nerves have no more power of affecting the consciousness, than have impressions made upon an eye whose optic nerve has been divided. And we can scarcely suppose that our authors mean to imply that the sense of touch has a set of centres distinct from the centres of common sensation; since we find that when treating of that sense, they do not consider it to be anything else than "an exalted form of common sensation." We can only account for this hypothesis, in fact, by attributing it to that deficiency of clearness in their conception of abstract ideas and of precision in their use of abstract terms, on which we have already had to remark, and of which we could adduce other examples from the present chapter.

Thus we find them remarking (p. 308) that "there is nothing" in the results of lesion in the spinal cord by disease or injury "to denote that the spinal cord does not share, in some degree, in the function of sensation and voluntary motion; all that we are justified in inferring from them is, that the union of the encephalon with the spinal cord is necessary for voluntary motion and for sensation." To us, on the other hand, these results appear unmistakeably to prove that although the spinal cord, when in connexion with the brain, is the immediate recipient of those impressions which, when transmitted to the encephalon, impress the consciousness and thus give rise to sensations, and although it is probably the seat of that executive power by which the mandates of the will originating in the brain are brought to act on the muscles, yet that its relations to sensation and volition are (to use our authors' own language) purely physical; that is to say, the changes which it undergoes merely serve to put the proper organs of sensation and volition into connexion with the outer world, just as when, at the stations of the electric telegraph, messages in cypher are received and re-transmitted without any cognizance of their meaning on the part of the signalizer, this being known only to the recipient at its termination. Our authors go on to cite the case of the Amphioxus as making it probable "that voluntary motion and sensation may exist where there is a well-developed spinal cord the anterior extremity of which tapers to a fine point." Now to us this seems a complete *petitio principii;* for what evidence is there that this animal even possesses sensation, much less voluntary motion? It is agreed on all hands that its eyes are rudimentary and cannot serve as instruments for vision, even if they can indicate the presence of light; yet no one would feel himself justified in asserting that this case proves that an animal can see without eyes. On what ground, then, is it affirmed that a vertebrate animal can possess volition without a cerebrum, or sensation without sensory ganglia? On no other, as it seems to us, than that vague presumption that every animal *must* possess volition and sensation, of which we have already pointed-out the fallacy. Certainly the actions of the creature itself do not justify any such conclusion; for they are of the simplest possible kind, not such as to afford the least evidence of the higher psychical endowments, and not more certainly indicative of sensation than many of those movements in ourselves which we know to be independent of it. If, then, we were to affirm that the Amphioxus furnishes us with a remarkable example of an animal of the Vertebrated type so low in grade of development that its life must be considered as altogether a reflex one like that of an anencephalous monster, we should, as it seems to us, state the case more consistently with facts than our authors have done, and with at least as much freedom from objectionable assumptions.

The Chapters on the Senses contain a large number of additions to our previous knowledge, on points of minute anatomy, derived from the original researches of our authors. As they give no clue, either in their preface or elsewhere, to their separate individuality, we can only guess from internal evidence that whilst the preceding chapters are the work of Dr. Todd, the anatomical portion at least of these is the contribution of Mr. Bowman. The account of the structure of the Skin is admirable, and only needs an addition on the comparative structure of the sensitive and vascular papillæ, as elucidated by the subsequent researches of Wagner and others, to be quite complete. Indeed if soda instead of potass had been used in the author's observations, for the purpose of rendering the papillæ transparent, he could scarcely have missed seeing the peculiar mode in which the nerves terminate in the sensitive papillæ, and he would have assured himself of their absence in the greater part of those which are penetrated by bloodvessels. These last seem to us plainly destined for the nutrition of the epidermis. They are developed to an extraordinary extent wherever the epidermis is peculiarly thick, this being usually the part in which there is the least tactile sensibility; thus we do not know a better example of them than is found beneath the thick cuticular pad of the dog's foot, where they have quite the aspect (when injected) of the fungiform papillæ of the tongue; and we find them also greatly enlarged in the interior of corns. The peculiar vascular matrix of nails and hoofs, moreover, is obviously nothing else than a modification of the ordinary papillary structure, just as these organs are modifications of the epidermis.

Our authors were undoubtedly the first to give an accurate account of the diversified forms of the papillæ of the Tongue; and succeeding observers have done scarcely anything but verify their descriptions. Our knowledge of the differences between the simple, the fungiform, and the conical papillæ, was previously of the vaguest kind. By them first it was shown that the fungiform papillæ, in virtue of their very thin epithelium, and of their copious supply both of nerves and blood-vessels, are pre-eminently adapted to serve the purpose of gustation; whilst the conical or filiform papillæ, through the comparative thickness of their protective covering, and the stiffness and brush-like arrangement of their filamentary productions, are obviously intended rather to be subservient to the mechanical action of mastication. In carnivorous animals, and especially in the feline tribe, the conical papillæ become much stiffer and stronger, while the fungiform are relatively far less numerous; and it is obviously by the former that the rasping action is performed, by which the surface of bones is effectually cleansed of all adherent meat.

In describing the olfactive apparatus, our authors were the first to draw attention to the peculiar limitation of the "olfactory region," as marked by a sienna brown tint of the epithelium, and by a great increase in its thickness, accompanied by a remarkable loosening of its texture, so that its particles form a thick, soft, pulpy stratum, very different from the delicate yet very transparent film of flattened and ciliated epithelium-cells, which covers the sinuses and lower spongy bones; and also to the peculiar character of the olfactive nerve-filaments, these being not furnished with the white substance of Schwann, but being nucleated and finely granular in texture, and altogether resembling those "gelatinous" fibres, which were at that time currently regarded as peculiar to the sympathetic system, but which are now known to occur frequently in the cerebro-spinal nerves. In almost every part of the description of the Eye, we find matter which was at the time of its publication quite new; and much of it still remains unsuperseded by the subsequent researches of others. Of this last kind is the description of the peculiar lamellated structure of the cornea, and of the intervening tubular spaces. Mr. Bowman's account of the minute structure of the retina was the first in which any approach was made to a discrimination of its diverse elements; and we here find most of the essential facts which have been since more fully elucidated by the admirable researches of H. Müller. The close resemblance of the vesicles of the grey layer to the vesicular matter of the cerebral convolutions was specially pointed-out—a fact of peculiar interest when taken in connexion with the history of the development of the eye, from which it appears that these two structures are actually continuous at an early period, the eye being budded-off, as it were, from the vesicle of the thalami optici. The structure and attachments of the ciliary muscle were also very carefully examined by him; and he advanced very strong grounds for the opinion of Porterfield, that its contraction serves to advance the lens towards the front of the eye, when adaptation of its focus to near objects is required. The recent researches of Cramer, Donders, and Helmholtz, however, confirmed by those of Dr. Allen Thomson, seem to have conclusively shown that the real method of adjustment is one which though formerly suggested, had been put aside by most physiologists as highly improbable, namely, an alteration in the *figure* of the lens; for they have demonstrated that the images of a luminous object, which, with proper management, can be seen to be reflected from the anterior and even from the posterior surface of the lens (as well as from the cornea), have their relative places and figures so altered by the direction of the eye from a remote to a near object, as unquestionably to indicate an alteration in the curvature of the reflecting surfaces. The account of the minute anatomy of the Ear, moreover, is not only distinguished by its completeness, but by the new facts ascertained by the author regarding the structure of the spinal lamina of the cochlea, the disposition and attachments of the cochlearis muscle, and the distribution of the cochlear nerves. And although the subsequent researches of Corti and others have brought into view some additional structures of a very remarkable aspect, the nature of these is as yet so problematical, that their existence affords no secure basis for physiological reasoning.

The remainder of the portion of the work devoted to the Nervous System and its functions offers no particular subject for remark; and we now pass on to that which treats of the Organic Functions. These are discussed in the usual order,—Digestion, Absorption, the Blood, Circulation, Respiration, Animal Heat, Voice, Secretion, the Ductless Glands, Generation, Development, and Lactation. This second part is fully equal to the first as regards its plan and execution; but on the one hand it contains far less original matter; whilst, on the other, having been brought out within a comparatively recent period, it is much more completely in harmony with the present state of our knowledge of the subjects it embraces. On both these accounts we shall have comparatively little to say respecting it; as we can neither have the pleasure of pointing out so frequently the special services rendered by the original researches of our authors; nor are we so often called upon to notice the errors or deficiencies which subsequent inquiry has made manifest.

Under the head of Digestion we first find described the anatomical characters of Mucous Membrane; and familiar as we now are with these, it would be ungrateful if we were not to remind our readers that it was in Mr. Bowman's article on that subject in the 'Cyclopaedia of Anatomy' that they were first clearly enunciated; the existence of the "basement-membrane" intervening between the epithelium and the subjacent combination of fibrous tissue with bloodvessels, lymphatics, and nerves, and constituting with the epithelium the essential part of a mucous membrane, having been first discovered by him. The peculiar modification which this membrane presents in the Stomach, moreover, and the structure of the gastric glands, are more fully described in this work than they had previously been; and the two principal varieties of gastric glands, subsequently more minutely differentiated by Professor Kölliker, are clearly distinguished, with a surmise regarding their difference of function which is probably not far from the truth. The account of the saliva needs to be modified by the results of subsequent inquiries, which have shown that a considerable difference exists both in composition and properties between the fluids secreted by the several pairs of glands. The peculiar share which the epithelium of the villi has been shown by Professor Kölliker and others to take in the function of Absorption, and the changes which its cells undergo, seem to have escaped our authors' observation; although they would seem, from some parts of their description, to have nearly approached this discovery. In speaking of Peyer's glands, they adopt the view of their secreting function which was current up to within a recent period; it has now been fully proved, however, by the researches of Brücke and others, that they are appendages of the lacteal system of vessels.

The chapter on Absorption strikes us as less complete than we could desire. The anatomy of the Absorbent System is minutely detailed; the only addition which it requires being an account of the structure of the absorbent glands, as since elucidated by Kölliker. In the general views here and elsewhere expressed respecting the functions of the absorbent system, we fully accord. Our authors regard it in the light in which it was first viewed (we believe) by Dr. Carpenter, as an extended secreting and assimilating apparatus; drawing its materials on the one hand from the contents of the intestinal canal, and on the other from the superfluous fluids of the tissues; and pouring these into the sanguiferous system, after having subjected them to their peculiar converting action. But the absorbent action of the sanguiferous system is scarcely noticed, the sole mention of it that we can find (p. 279) being far less explicit than its unquestionable importance requires. For it is now quite clear that all alimentary matters which are reduced in the digestive process to a state of perfect solution, such as albumen, gelatine, sugar, and saline substances, are readily taken-up by the bloodvessels; and that foreign matters, such as alcohol and poisons generally, are received into the system almost if not quite exclusively through this channel; the special function of the lacteals being to absorb and prepare that peculiar combination of oleaginous and albuminous matter known as chyle, which is remarkably constant in its composition, whatever be the nature of the contents of the alimentary canal, whilst the composition of the blood of the mesenteric veins is greatly influenced by what it has taken up of these. Further, it has been clearly shown by the experiments of Bernard, that the liver exercises an important assimilating influence upon certain of the matters absorbed by the gastro-intestinal blood-vessels; and of his experiments upon this subject we find no notice either here or elsewhere; his researches on the glycogenic function of the liver being alone referred-to.

In the Chapter on the Circulation, the most original portion is the account of the fibrous coat of the arteries; in which we find the first mention of the fusiform cells of the non-striated muscular fibre. The question of the forces by which the movement of blood is maintained and regulated, receives very full consideration; and we are glad to find our authors according in the doctrine which was first formally stated by Dr. Alison, and which has been since adopted and defended by other physiologists, that the circulation in the capillaries is greatly influenced by the operation of a force developed by those chemical and physical changes which take place between the blood and the tissues, and in which the phenomena of nutrition essentially consist. The account of the minute structure of the Lungs, in the chapter on Respiration, is somewhat less complete than could be wished; and we are surprised to find our authors expressing an opinion against the existence of an epithelial lining to the air-cells in Man, partly on the ground that in some of the lower Mammalia,—as the kangaroo, rat, and mouse,—the terminal air-spaces are too minute to contain even a single particle of epithelium, and cannot therefore be lined by a pavement of such particles. In the lung of the Bird we believe it to be quite true, as Mr. Rainey first pointed out, that the capillaries form a solid plexus round the extremities of the bronchial tubes, and that the air passes freely into the meshes of this plexus, so as to come into immediate contact with the capillaries; and it seems to us not improbable that in the Rodents and Marsupials, whose general organization presents so many features of approximation to that of Birds, the structure of the lungs should partake more of the ornithic type than of that which characterizes the higher Mammalia.

Passing over the chapters on Animal Heat and on the Voice, which contain nothing that calls for special remark, we come to those on the Organs of Secretion, which have been written with great care, and generally with full use of the most recent researches. Thus the account of the minute structure of the Liver is given according to the views of Dr. Beale, to which our authors give the sanction of their authority; but although an opportunity is here afforded of introducing an account of the more recent researches of Bernard and others on the functions of the liver, no addition is made to what had been stated on this subject five years previously, except a notice of Bidder and Schmidt's inquiries on the rate of the biliary secretion; and no notice whatever is taken, even in the list of works referred to at the end of the chapter, of Dr. Handfield Jones's views on the structure and functions of this organ, which, even if not received as valid, have still, we think, a claim to be mentioned. The chapter on the Kidney is of course based chiefly on Mr. Bowman's own admirable researches, which, although called in question by Gerlach and others on some minor points, have triumphantly stood the test of critical examination, and have been confirmed by the best observers in every particular. We were ourselves at one time inclined to believe with Gerlach that the Malpighian tuft is covered with epithelium, which might be presumed to be underlaid by a basement-membrane; in which case the position of the Malpighian tuft might be considered to be really outside the dilated extremity of the urinary tubule, instead of inside. And this seemed so much more conformable to analogy, that an eminent anatomist expressed to us his conviction on *à priori* grounds alone, that it *must* be so. But we are now satisfied that Mr. Bowman is correct in stating that the small granular or nucleated cells which may be frequently observed in connexion with the vessels of the Malpighian tuft, are not epithelial, but are situated either within the vessel itself or enclosed in its wall. And the danger of relying too strongly upon *à priori* considerations in matters of this kind, has been since made obvious by the discovery of numerous cases in which a basement-membrane is perforated by capillary blood-vessels; so that the entrance of the ramifications of the renal arteries into the tubuli uriniferi ceases to be exceptional. The account of the structure of the Spleen, which occupies a considerable part of the Chapter on the Ductless Glands, is chiefly based on the researches of Mr. Gray; and that of the Thymus Gland, on those of Mr. Simon. It would have been well, we think, if the structure of the Thyroid, which has been very completely investigated by Kölliker and others, had been more minutely described and illustrated, with special reference to the pathological alterations which this body so frequently undergoes.

The chapters on Generation and Development do not require any comment. They contain an excellent summary of all that it is most important for the student of Human Physiology to know, including the results of the most recent inquiries, with such references to Comparative Physiology as greatly increase the interest attaching to the account of these important functions. But, with the exception of a few points of minor importance, we miss the evidence of original research which had been previously so conspicuous; and we are led both by this circumstance and by an intimation afforded in the Preface, to conclude that this portion of the work has been mainly executed by Dr. Beale, to whose judgment and ability it does great credit.

Having thus brought our survey of this admirable work to a conclusion, it is scarcely necessary for us to repeat what we have already said of its peculiar merits. It were now vain to wish that it could have been completed as it was commenced; and we can only express our warmest thanks to our authors for what they have been able to accomplish, and assure them that in commenting upon the deficiencies of their work, we have simply acted in accordance with what we consider to be our duty to the profession which has so heartily received it. It has been a far more pleasant task to us to point out its features of remarkable excellence, and to show in how many particulars the results which it embodies of skilful and zealous research do the highest credit to its able and accomplished authors. It would be a serious omission were we not to take special notice of the admirable and copious illustrations, the execution of which (by

Mr. Vasey) is in the very first style of wood-engraving. A large proportion of those in the first volume are original, and are chiefly, we believe, from the pencil of Mr. Bowman.

We have so frequently had occasion to notice the distinguishing characteristics of Professor Dunglison's 'Human Physiology,' on the appearance of its successive editions, that we have now only to announce the recent publication of an eighth, which is distinguished, like its predecessors, by the copiousness of the new materials derived from the encyclopædic range of its author's reading, rather than by any special originality either in fact or in doctrine. Its continued popularity in the United States, notwithstanding the rivalry of the numerous British and Continental treatises which are reproduced there, is an evidence of the high appreciation which its judicious selection and careful compilation of materials have gained for it; and even the most original thinkers and workers may consult its pages with advantage, for reference as to what has been done by others.

We have also before us a new American treatise on Physiology, whose merits are of a very different nature. Professor Draper is chiefly known to the scientific world by his labours in the domain of Physics and Chemistry, many of which have taken a very high rank, especially those that have had a special bearing on the Science of Life. But he has long taught Physiology, as well as Chemistry, in the University of New York; he has brought to bear on this subject a mind not only richly stored with the knowledge of Physical Science, but also trained in the exact habits which are fostered by that pursuit; and he has consequently been led to regard its facts and doctrines from a point of view by no means coincident with that from which they are usually looked at by the pure Physiologist. We do not think, however, that it is quite so different as the author himself seems to believe. For although he professes to explode the idea of Vital Force as an agent *sui generis*, resolving every change in the living body into a "physical impression," yet he does not succeed (to our apprehension at least) in thus accounting for the unquestionable peculiarities in the phenomena it presents. As we have remarked in the earlier part of this article, we have just as much ground for the assumption of Vital Force as a peculiar mode or manifestation of dynamical agency, as we have for that of Heat or Electricity. We may generate Heat by Electricity, or Electricity by Heat, or either by Mechanical Motion, or Mechanical Motion by either; but still Heat is neither Electricity nor Mechanical Motion; and believing as fully as Dr. Draper can do, that every action in the living body is either directly or indirectly referrible to an antecedent "physical impression," we yet maintain that there is a large class which cannot be properly denominated either chemical or physical, and which may be most philosophically referred to a distinct category having facts and laws of its own. Thus, if we examine the effects of warmth upon a germinating seed or an impregnated egg, we witness, it is true, certain chemical changes both in the organic substance and in the surrounding air; but these phenomena are only exponents of changes of a far more essential nature, for the very description of which physics and chemistry have no language,—changes which issue in the evolution of a structure altogether different from anything which the physicist or chemist can even devise, and distinguished by properties entirely foreign to any that are presented by inorganic matter. We think we could point out in Professor Draper's work numerous passages wherein he admits this distinction in fact, though he professes to deny it in words; the necessities of the case forcing him to a recognition of what his principles would lead him to repudiate. The moving spring of all these actions we believe, with Professor Draper, to be the Heat which the germ receives; but it is the attribute of the living germ to convert this physical force into that other mode of force which we distinguish as Vital, in virtue of the peculiarity of the phenomena it brings to pass.

As the author candidly admits "that, beyond the suggestion of a trifling fact or idea here and there, the matter presented is not original with him, but derived from other sources,—his reading, during many years, of the chief works on Physiology and its kindred subjects,"—there is no occasion for us to enter upon any detailed survey of his work, which mainly consists of the text of his Lectures; but we may state, generally, that it contains a very lucid and on the whole complete summary of the science as it stands; and that, with the exception to which we have already referred, it may be considered a very trustworthy guide to the student. Many of the illustrations are original; and several have been obtained by the aid of microscopic photography, this process having been so far improved by the author as to be rendered very available for such uses.

We may notice, as a distinctive feature in the plan of the work, the author's division of the subject into two branches, Statical and Dynamical Physiology. Under the former head he ranges not only all the material conditions of Life and the Organic functions, but also the Animal Functions; whilst under the latter he gives an account of the influence of Physical Agents and the phenomena of Reproduction and Development. It does not appear to us that such a division can be philosophically established in the science of Physiology; at any rate the line must be drawn very differently from that in our author's map of it. Not merely Reproduction and Development, but every other functional change, has its dynamical aspect; and from this the statical view cannot in our apprehension be advantageously separated. It is surely a mistake to place Reproduction and Development under a category altogether different from Nutrition, which has been well characterized as "a perpetual reproduction," or from Secretion, the performance of which involves a continual renewal of the secreting cells. On the whole, we do not think that anything is gained by Professor Draper's division; and much would be lost in convenience of grouping, if that division were consistently carried out. Still we think that great advantage would ensue, if, alike in Physiology as in every other science, a clear distinction were always maintained between the *material* and the *dynamical* conditions, of which the aggregate makes up the *cause* of every phenomenon.—We must not omit to make special mention of the last two Chapters of Professor Draper's work, as amongst the most interesting and original of the whole. In the former of these, "On the influence of Physical Agents on the Aspect and Form of Man and on his Intellectual Qualities," the views of those who maintain the unity of the Human Species and the modifying influence of external agencies in giving rise to varieties of form and character, are unreservedly adopted, and supported by new considerations. In the latter, entitled "Social Mechanics," Man is considered in his social relations; and a very interesting sketch is given of the history of modern civilization, and of the various influences which have contributed to its development.

REVIEW II.

Cranial Presentations and Cranial Positions: Suggestions, Practical and Critical. By R. U. WEST, M.D. (Reprinted from 'Glasgow Medical Journal.')—*London*, 1857. pp. 60.

SINCE the date of Nägele's enunciation of his views of the mechanism of the presentations and positions of the fœtus during labour, no more able or valuable treatise upon the subject has been published, than this of Dr. R. U. West. Dr. West's observations, based upon large clinical experience, and analysed with unusual critical acumen, do not confirm the theory somewhat magisterially laid down by Nägele, and which has been so firmly impressed upon subsequent writers. The feature of Nägele's theory which we believe to have had the greatest influence in promoting its ready reception, is its apparent and real comparative simplicity. Simplicity seems to bear presumptive evidence of truth. It recommends itself, further, by affording an easy solution of what we had been accustomed to look upon as a very difficult and complicated problem. In this feature, however, Dr. West's exposition may vie with that of Nägele.

After reviewing the conflicting theories of other writers, Dr. West cites the doctrine of Nägele as the subject-matter for investigation. This doctrine is:

> "That in cranial presentations the fœtus is generally placed in two different ways in the entrance of the pelvis—namely, 1st, With the right parietal bone, as the part standing deepest, foremost, the smaller fontanelle directed towards the *left* side, and more or less *forwards*; and 2nd, with the left parietal bone foremost, the smaller fontanelle being directed towards the *right* side, and more or less *backwards*."

In this view Dr. Simpson appears to concur. And so far as the first position is concerned, if we take that position to be the first, which is by far the most frequent, and therefore, presumptively, *par excellence*, the normal position—Nägele is in accordance with almost every observer. With regard to the second, not only as to the question of its being next in order of frequency, but also as to the question whether it be the only other normal position, Nägele is completely at variance with many most excellent and philosophical observers whom, in a spirit not quite philosophical, he accuses of ignorance. The question arises, whether the discrepancy between Nägele and those whose conclusions he denounces, may not be reconciled by a careful analysis of the circumstances and *periods of observation* of the cases? For example, the second position, in order of frequency, is commonly held to be that in which the occiput is directed to the *right* foramen ovale, being the exact converse of the first. Nägele contends that this is exceedingly rare as an *original* position; but that all observers —excepting himself, for he is a little dogmatical—have been led into error upon this point by having failed to take note of the true position of the occiput at the commencement of labour, and to trace its evolutions during the labour. He maintains that, in those cases where the occiput comes forward from the *right* of the pelvis towards the arch of the pubis in the final act of extrusion, the head, before entering the brim, lay in the *right* oblique diameter, with the occiput against the right sacro-iliac synchondrosis; and that during its course through the pelvis it is gradually screwed round, the head undergoing an axial twist, so as to make the occiput describe a quarter turn forwards from the sacro-iliac synchondrosis to the foramen ovale.

Here Dr. West enters the lists, and records as the result of his own observation, that, concurrently with all others, he has found the most frequent position of the cranium to be the following:

> "*First Position of the Cranium.*—Right ear near symphysis pubis, occipital end of head descending, first in the axis of the brim, and finally coming round to the arch of the pubes by the *left* side."

The next most frequent position is the

> "*Second Position of the Cranium.*—Left ear near symphysis pubis, occipital end of head descending, and coming round to the arch of the pubes by the *right* side."

This, it will be observed, is the *exact converse* of the first position. The next most frequent position is the

> "*Third Position of the Cranium.*—Left ear near symphysis pubis, frontal end of head descending in the axis of the brim, and finally coming round to the arch of the pubes by the *left* side."

This, it will be observed, is Nägele's second position, carried through to its termination, instead of the head being twisted into the left oblique diameter in the course of labour, as Nägele contends it always is. The next and last is the

> "*Fourth Position of the Cranium.*—Right ear near symphysis pubis, frontal end of head descending, and finally coming round to the arch of the pubes by the *right* side."

This is the exact converse of Dr. West's third position.

The following is the clinical basis of this exposition:

"Of 715 children," says Dr. West, "born in my practice since the 1st of January, 1852, 682 presented the cranium. With 201 of these births I had not the opportunity of ascertaining the original position. Of the remaining 481—

306	presented	the cranium	in the	first	position.
151	„	„	„	second	„
15	„	„	„	third	„
9	„	„	„	fourth	„

In all these cases Dr. West accurately observed the progress of the head into and through the pelvis.

Dr. West explains his objections to Nägele's account of his second position as follows:—

"I am inclined to think that in his description of his second position, when he maintains that the anterior fontanelle is *always* felt turned forwards towards the left acetabulum, he has deceived himself in the majority of his cases of this position by a fallacy, arising partly from taking the examination in the axis of the outlet, when the presenting part is in reality passing down in the axis of the brim, and partly from another circumstance, to which I shall presently come. When we feel in the axis of the outlet for the sagittal suture, the finger, as Nägele truly says, strikes on the centre of the parietal bone; and the presenting part of the child's head may be described, the head lying in the plane of the cavity. In this position it will be seen that the central portion of the sagittal suture, which is the vertex, is passing backwards to the floor of the pelvis. The left branch of the lambdoidal suture is pointing forwards to the symphysis pubis when the ear may be felt; and—what is more important, as due to the form here assumed by the sagittal suture—namely, that of a *curved* line, as felt in an examination conducted in the axis of the outlet, in which the finger is directed to the *side* of the head—the anterior fontanelle *appears* also to be directed forwards. Now—and here we come to the second probable fallacy by which Nägele has deceived himself—when the woman lies on her *left* side,* the accoucheur using his right hand in making an examination, it will be understood that the finger passes much more readily downwards and to the left side than upwards to the right side, so that in the second position it is pretty sure to touch the anterior fontanelle and that portion of the sagittal suture leading to it, which will *seem* to be in the right oblique diameter. I have convinced myself of this repeatedly, by the simple expedient of placing my patient on her right side, and then, by using the left hand, the finger has passed more readily to the *posterior* fontanelle, which in its turn would appear to point most forward, the case thus assuming all the characters of an exact converse to one of the first position. But this is not all. As the head descends further towards the floor of the pelvis, this apparent forward position of the anterior fontanelle frequently becomes more pronounced, through a rotation of the head on its *ear-axis*, the posterior fontanelle and occiput descending more and more, and being *apparently* more and more backward, for, as I have endeavoured to show, the *floor* of the pelvis, as respects the *brim*, is the *posterior* part of it as respects the *outlet* or *axis of examination*. . . . . This apparent forward or really *upward* position of the anterior fontanelle, may be perceived equally, also, when the head is in the first position, if the woman lie on her right side and the accoucheur use his left hand, as in the second, when the converse proceeding is adopted."

Thus Dr. R. U. West's scheme of cranial positions is confirmatory of those of Dugès, Saxtorph, Maygrier, Capuron, Bodin, Lambin, Busch, and Moser. It is also similar to that of Carus and Jörg, if we simply transpose the third and fourth positions of these authors.

[* It is to be observed that in Germany women are commonly delivered in the dorsal position.—Ed.]

Dr. West next adduces some interesting remarks on the diagnostic value of the ear, which he takes as the basis of his description of the position of the head instead of the occiput, which latter part we maintain, nevertheless, is more convenient for this purpose, and less conducive to confusion.

"It is asserted by some (says Dr. West), and assumed by nearly all, that the ears lie exactly opposite to each other, so that when one ear is at the symphysis pubis, for example, the other is near the centre of the sacrum. Now, having frequently felt the ear exactly at the symphysis when the occipital fontanelle was as clearly at the acetabulum, I commenced the plan of measuring a few heads immediately after birth, and found more satisfactory proof than in *vertex* presentations; when an ear is at the symphysis pubis, the head is already in the most favourable *oblique* diameter of the pelvis, instead of being, as Dr. Ramsbotham and others suppose, in the transverse diameter. Thus, in one head measuring from tip to tip of the ears round the outline of the presenting part of the head—a line just including both fontanelles—I found the line over the anterior fontanelle to be 7½ inches from ear to ear, while that which included the posterior fontanelle was only 5 inches; in another, anterior, 8 inches, posterior, 4½ inches, and so on. As the head descends, it will be found that the sagittal suture is gradually assuming greater and greater obliquity, while the ear still remains at the pubes, where it may frequently be felt until almost the very last.

"In the application of the long forceps, moreover, it will almost invariably be found, after the extraction of the child, that while one blade, having passed over or near an ear, will have indented the mastoid process of the temporal bone of one side, the other blade will have left a mark on the *brow* (just above the eye) of the opposite side. In cases of first position, it will be the left mastoid process and the right brow. In cases of second position, it will be the right mastoid process and the left brow. Now, the blades have been applied one on each side of the pelvis, and in a line upwards from the presenting vertex."

We regret that we cannot reproduce the entire exposition of Dr. West. It deserves to be studied entire, and we accordingly recommend it to the deliberate examination of our readers. We present a summary of points to which he directs attention:

1. A more correct appreciation of the diagnostic value of the presence of the ear at the symphysis pubis; the ear in the great majority of cranial presentations lying in that situation during the whole progress of the head into the pelvis.
2. That in *vertex* positions, the presence of the ear at the pubes proves that the hand is already in a favourable oblique occipito-anterior position, becoming more and more so as the os occipitis comes more and more within contact, although the ear may not have left the symphysis.
3. When the occiput is fairly under the arch of the pubes in the last stage, the long diameter of the hand will be found to be accurately in the long diameter of the outlet, the two lambdoidal sutures being evenly one on each side of the symphysis, and the anterior fontanelle exactly on the raphe of the perinæum, as described by all writers, except Nägele and those who follow him.
4. That in this last position the ears are at each acetabulum, rather than at each ilium, as taught in books.

5. That the first and second most frequent positions of the vertex are, in the majority of cases, the converse of each other, as taught by nearly all writers except Nägele.

6. That in his grand discovery of the universality of *bregmato-cotyloid* positions in the second position, he has deceived himself by not reversing all the conditions, both of the patient in her position, and of the examining hand of the accoucheur.

7. That Nägele, in maintaining that his predecessors are all wrong in this matter, has deliberately confounded mere bregmato-cotyloid with *fronto*-cotyloid positions, the latter being always intended by writers, though they may have loosely denominated them presentations or positions of the *vertex*.

8. And that, therefore, Nägele is right in maintaining that the normal progress of the labour in bregmato-cotyloid positions, as in all true *vertex* ones, is for the occiput to make its way to the arch, and that quite as easily, *cæteris paribus*, as when the occiput lies originally most forward.

9. That there are only *two* positions of the *vertex*—that is, only two ways in which, in vertex presentations, the head enters the pelvis, and makes its way to the outlet.

10. That in all, or nearly all, presentations of the *vertex*, the occiput will surely come to the arch of the pubes by a natural and necessary process; and that, whether the vertex presentation be bregmato-anterior or bregmato-posterior originally.

11. That the cases which terminate with the face or forehead at the pubis, are originally positions in which the uterine efforts are so perversely directed, that the forehead gets down into the pelvis during the first step.

12. That in that first step the ear is usually at the symphysis, as it is also in vertex presentations.

13. That in these perverse cases, which are usually *bregma* presentations, the ears will really occupy opposite parts of the pelvis, the head lying at first with its long diameter in a transverse position across the pelvis.

14. So that some of them may terminate with the occiput at the arch, after a very hard labour.

15. But the original perverseness in the direction of the uterine efforts, which has placed the head in this unfavourable position, continuing, the anterior or frontal end of the head will frequently pass first to the floor of the pelvis, and then come forward to the arch of the pubis.

16. That Nägele, on his own showing, had never seen a genuine case of true *fronto*-anterior position, incredible though it may seem.

17. That Nägele is quite as wrong in maintaining that all first positions are originally occipito-cotyloid, as that all second positions are originally bregmato-cotyloid positions.

18. But that most of the bregmato-cotyloid positions met with are merely instances of a kind of *deceptio tactûs*.

In the second part of his essay, Dr. West gives clinical illustrations of Unusual Cranial Presentations and Cranial Positions. These form the most decisive answer to the theoretical dogmas of Nägele, that they "cannot and never do occur." Two cases of "occiput to pubes," are recorded.

In conclusion, we cannot be so negligent of our duty as to omit to record our opinion that this essay of Dr. West is a rare and valuable example of the application of acute reasoning and clear judgment to the stores collected by industrious observation and long experience.

Review III.

1. *Statistics of Insanity;* being a Decennial Report of Bethlehem Hospital from 1846 to 1855 inclusive. By W. Charles Hood, M.D., Resident Physician, &c. &c.—*London.* 8vo, pp. 121.
2. *The First to Eleventh Report inclusive of the Commissioners in Lunacy to the Lord Chancellor.* I. to XI. 1847–57.
3. *The Reports of Committee of Visitors of the County Asylums for Insane Paupers.* 1857.
4. *Rapport du Directeur de l'Administration Générale de l'Assistance Publique à M. le Préfet de la Seine, sur le service des Aliénés du Département, pour l'année* 1855.

Report to the Prefect of the Seine, on the Care of the Insane of the Department, for the year 1855, *by the Director of the General Administration of Public Relief.*

5. *Observations and Essays on the Statistics of Insanity.* By John Thurnam, L.R.C.P., &c.—*London,* 1845. pp. 184.
6. *The American Journal of Insanity.* Edited by the Medical Officers of the New York State Lunatic Asylum. 1855–57.
7. *Journal of Psychological Medicine and Mental Pathology.* Edited by Forbes Winslow, M.D., D.C.L., &c. 9 Vols. 1848–57.
8. *The Asylum Journal of Mental Science.* Published by authority of the Association of Medical Officers of Asylums and Hospitals for the Insane. Edited by John Charles Bucknill, M.D. 4 Vols. 1853–56.
9. *Report of Her Majesty's Commissioners appointed to Inquire into the State of Lunatic Asylums in Scotland.* With an Appendix.—*Edinburgh,* 1857.
10. *Reports of the Committee of Visitors of the Middlesex County Lunatic Asylum at Hanwell from* 1831 *to* 1857.

Among the many specialties into which the practice of medicine is divided, none perhaps have been for so long a period, nor so thoroughly, distinct, as that of Lunacy. The practitioners of this particular branch of medicine seem almost to be banished from the general family of their professional brethren; they appear to have separate sympathies, separate modes of life, separate studies, and a separate literature: this may be in some measure accounted for by the social and political position in which their patients must be placed while under their treatment. But the disease or diseases which form the subject of the specialty, must always command an attentive consideration of the profession, on account of their pathological importance and their connexion with medical jurisprudence.

The writings enumerated at the head of this article form a part of the literature of the specialty, and it will be seen there exists among all the authors a general predilection for statistics.

Dr. Hood has proposed to himself the task of examining and reviewing the statistics of insanity as exhibited in Bethlehem Hospital during the ten years from 1846 to 1855 inclusive. We propose to take Dr. Hood's work as the basis of the following Review, and shall draw from the other works such information as we may be able to glean, to elucidate, confirm, or correct the statistics of Bethlehem. For as Dr. Hood himself points out in several places, the statistics as exhibited at Bethlehem are not the statistics of the disease as exhibited elsewhere. Dr. Hood states that—

> "It is necessary to bear in mind the particular rules of the Institution, which are peculiar to it and St. Luke's. These regulations render ineligible all applicants who have been insane for more than twelve months, all who are afflicted with paralysis, epilepsy, or any other form of convulsive disease; all who have been discharged *uncured* from other hospitals; and all aged and weak persons and pregnant women. In addition to which, those who have not recovered at the expiration of a year after admission are dismissed."

Dr. Hood's Report is therefore essentially a decennial report of a particular establishment, and he has compared the results and collated them with the best authors on the subject—Esquirol, Prichard, and Thurnam.

Most of the other Reports mentioned above, resemble Dr. Hood's in containing matter of interest only to the institution from which they emanate, and much of the information contained in them is addressed to non-medical readers—to committees of visitors, to heads of departments, to governors, and such like. In this review, of course only the purely medical portions of these Reports will be considered.

Dr. Hood divides his subject into sixteen classes. The first eight include what may be called the personal history of the patient previous to the attack—as age, sex, education, religion, domestic condition (that is, whether married or single), the social condition (or occupation), residence. His ninth class refers to the apparent and assigned causes of the disease.

Dr. Hood's three next subdivisions have reference to the previous history of the disease—viz., its duration, the number of attacks, &c. Tables twelve to sixteen relate to the present attack—viz., to the period of the year in which the disease occurred, the state of the general health, the form of the disease, the treatment, causes of death, and the post-mortem appearances.

There are therefore three or four matters of great interest left untouched, and on which the statistics of Bethlehem can afford no information—such as the proportion of curable to incurable cases of insanity generally, the liability to relapse, and to second attacks of the disease, the probable longevity of insane persons, and the probable duration of the malady. But though by the peculiar regulations in force at Bethlehem for the admission of patients, the possibility of coming to accurate conclusions on many of these points is precluded, still their tables may afford assistance in corroborating or contradicting the results of statistics drawn from other sources.

There are three points of view from which this large mass of statistical information may be studied by the medical man—viz., the pathological, the psychological, and the therapeutical; and it may be stated generally that it is the two latter that furnish by far the larger quantity of materials for review, and it is probable that if any accurate estimate could be made, it would be found that the psychological monopolizes the greater share of the literary labours before us.

With respect to the *personal history* of the insane previous to the attack of insanity, one of the most important matters for investigation is *the age* at which the disease is most liable to occur.

> "Esquirol considered that the liability to insanity went on progressively increasing after maturity. . . . . Esquirol assumed that the liability to insanity at different ages is represented by the proportion which the existing cases of insanity bear to the existing population of the country."*
>
> "It is obvious," as Dr. Thurnam remarks,† "that the age at admission into hospitals for the insane can never supply the want of information as to the age of the first origin of the disorder."

The proper mode of ascertaining with accuracy the period of life most obnoxious to an attack of insanity, is to collect the ages of patients at the first onset of the disease. The age on admission at Bethlehem Hospital will only afford this information—it will give the period of life at which insanity, when it has not existed more than twelve months, is most common.

Dr. Thurnam, however, in his work on the Statistics of the Retreat, near York—a work often quoted by Dr. Hood—has collected data on this question in the seventh Table, and also in the seventeenth Table, of his 'Observations and Essays on the Statistics of Insanity.'

The seventeenth Table shows the proportion *attacked* with insanity at different ages out of every 100 patients. Dr. Thurnam's calculations were based on 5122 cases, treated in nine asylums. The writer has constructed a similar Table, based upon 1766 cases that he finds in the statistical Tables published in the 'Hanwell Reports,' 810 of which, however, are included in Dr. Thurnam's 5122. Dr. Thurnam has arranged his Table in decennial periods.

Hanwell, from 1840 *to* 1857: 1766 *Cases.*

		per ct.
Congenital	2·66	13·29
Under 10.	1·00	
From 10 to 20 . . .	9·63	
„ 20 to 30		23·89
„ 30 to 40		28·76
„ 40 to 50		18·57
„ 50 to 60		10·02
„ 60 to 70		4· 30
„ 70 to 80		0· 80
„ 80 to 85		——

Dr. Thurnam: 5122 *Cases.*

	per cent.
Congenital	12·86
Under 10.	
From 10 to 20	
„ 20 to 30	32·04
„ 30 to 40	24·97
„ 40 to 50	17·10
„ 50 to 60	8·24
„ 60 to 70	3·79
„ 70 to 80	·96
„ 80 to 85	·03

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* Hood, pp. 18 et seq.

† Op. cit. p. 160.

It will be seen that Dr. Thurnam's Table shows that the greatest liability to the disease exists in the epoch between twenty and thirty; while the statistics of Hanwell make the epoch from thirty to forty to be the most liable to insanity. That the period of life between the ages of twenty and forty is that in which insanity most frequently commences, appears to be settled; but whether the first ten years, or from twenty to thirty, or the second decennial epoch, from thirty to forty, renders the subject more liable to the attack, is not so definitively decided.

The liability is certainly almost as great between the ages of twenty to thirty as between thirty and forty; and the numbers attacked in the former period were found by Thurnam to be even more in special cases than in the next decennial period. This Dr. Thurnam found to be the case among the fraternity of Quakers, as demonstrated by the statistics of the asylum for that religious sect, near York, called the Retreat; and also in the American asylums. The Hanwell statistics show, indeed, a slight declination toward forty years of age, for by taking quinquennial periods, there were 259 patients attacked between thirty and thirty-five, and 249 between thirty-five and forty. The Bethlehem Tables show the admissions to be more numerous between twenty-five and thirty, than between thirty and thirty-five, or thirty-five and forty; but this may be accounted for by the fact that since the patients are selected in relation to their supposed curability, there would be more chance of cure at the earlier epochs of life. And, on the other hand, the statistics of the English county asylums include patients admitted with epilepsy, as well as idiots and imbeciles. The Tables published by the Director-General of Hospitals for the department of the Seine, France, distinguishes between those admitted under the denomination of 1, Fous; 2, Idiots and Imbécilles; 3, Epileptiques; and the following Table, classified according to age, is given, to which we add a similar calculation deduced from the Hanwell Tables for comparison.

	Under 20.	20–30.	30–40.	40–50.	50–60	60–70.	70–80.	80–90.
Maniacal cases (*fous*), France	·68	16·59	26·90	23·60	14·77	9·04	5·66	1·75
All cases (1586), France	4·29	19·86	25·79	22·19	13·87	8·58	5·29	1·64
All cases, Hanwell	13·29	23·89	28·76	18·57	10·02	4·30	0·80	—

If, then, we include maniacal cases only, it is probable that the liability to attack is greater between thirty and forty; and one can readily understand how the average age is brought lower when idiots and epileptics are included; and indeed, among the males in France the greatest liability is between the ages of forty and fifty, the attacks at which period, during the year 1855, were 29·30 per cent. of the whole.

We come now to examine *the liability* to insanity *in the sexes.* In 1852, according to the returns of the Commissioners in Lunacy, there were 17,412 lunatics in England and Wales. By the census of 1851, there was in England a total population of 16,921,888; and of these a proportion of 8,281,734 were males, and 8,640,154 females; if 17,412 lunatics be divided in the same ratio, there should be 8521 male lunatics, and 8891 female; but there were, instead of these proportions, according to the Commissioners' Report, only 8247 males, and 9165 females; so that the existing female lunatics are, relatively to the population, more numerous than the males. This is not, however, because females are more disposed to insanity than males, for the statistics show that the contrary is the fact.

> "It is evident," says Dr. Hood, "that to compare the simple number of cases existing at one time, would give no true result. We must take the cases occurring, and not the cases existing, if we would arrive at any correct conclusion respecting the comparative liability of men and women to insanity."

Table fourteen of Dr. Thurnam shows the numbers and proportions of each sex out of 71,800 patients admitted into various asylums; of these, 25,601 were males, and 22,502 females; or in the proportion of 53 per cent. of males, and of 46 per cent. of females; and since in the population generally the females exceed the males, it follows the males are more liable to attack.

Since, therefore, more males are attacked, and the proportion of females remaining under treatment is even larger than it should be according to the relative numbers of the sexes existing in the population, it follows that the cases in the male are of shorter duration; and we shall see that a fatal termination of the disease is the mode by which the numbers are kept down.

The *Influence of Sex* on *Recovery* is the next point discussed by Dr. Hood. From what has gone before it is evident that in males the disease terminates at a much earlier period, and we shall find that it terminates by death; but it does not therefore follow that the disease is more curable in females; for the disease, though it do not terminate fatally, may continue, and pass into a chronic and more permanent state.

> "The experience of Bethlehem during the ten years under consideration . . . shows that 905 out of 1663, or 54·4 per cent., recovered among the women, and 574 in 1066, or 53·8 per cent., among the men."

The cases at Bethlehem are picked. It is therefore interesting to consult tables made up from other establishments. Dr. Thurnam remarks—

> "That the probability of recovery is greater in women than in men, may now be regarded as established. . . . With two exceptions, in every institution the statistics of which I have examined, in which the experience was extended over more than a very short period of years, the porportion of recoveries in women has exceeded, often to a great extent, that in men. . . . Thus, in the asylum at Glasgow, the recoveries in women have exceeded those in men by 4 per cent.; at Belfast, by 5; at Lancaster, by 7; at Armagh, by 10; at Woodbridge, by 12; at Worcester, U.S., by 19; at Siegburg, by 19; Bethlehem (1827 to 1839), by 20; at the Retreat, at York, by 20; at Schleswig, by 22; at Charenton, by 23; at the York Lunatic Asylum, by 28 per cent." (p. 28.)

Dr. Thurnam adds:

> "I am only acquainted with two asylums in which, during any period, the recoveries amongst men have actually exceeded those amongst women. These two are, Hanwell, where the relative numbers were 22·9 per cent. among males, and 21·62 per cent. among females; and at Bloomingdale Asylum, near New

York, U.S., where, during a period of more than twenty years, the recoveries amongst men have exceeded those among women by 28 per cent."

It is somewhat remarkable that the excess of cures among men should occur at two metropolitan asylums—that is, at New York, and in the London asylum at Hanwell; and that, as Dr. Hood points out, of late the cures of males at Bethlehem are nearly in the same proportion as among the females.

By reference to the statistical tables of the Parisian asylum, also, we find that the number of cures among the males exceeds that among the females, in the proportion of 13·92 per cent. for males, and 12·85 per cent. for females. Or—

> "For the class of insane only (*i.e.* not including the epileptic and imbeciles) under treatment at Bicêtre and Salpêtrière in 1855, the recoveries have been 24·49 per cent. for the males, and 20·91 per cent. for the females."

The mean of the two sexes being 22·24 per cent.

The statistics published by Dr. Thurnam with respect to Hanwell were from the year 1831 to 1841. It will be interesting to examine these with results of later date, which will bring them into better comparison with the work of Dr. Hood and the Parisian Report, and the very copious statistical tables that are published by the authorities of Hanwell readily enable us to do so.

In the last Report, published January, 1857, it is stated (page 94), that from May 16, 1831, to the end of 1857, there were admitted into Hanwell 4276 patients, of whom 2181 were males and 2095 females; and that there have been discharged recovered 526 males, or in the proportion of 24·11 per cent.; and 549 females, or in the proportion of 26·20 per cent.

In considering the per-centage of recoveries in any institution, it is essential to bear in mind the time in which the cure is accomplished. In some institutions the cases are of a more chronic character than in others. Thus, while there has been an average of 25 per cent. of recoveries at Hanwell of all the cases received into the asylum, the recoveries per annum of the cases under treatment amount to an average of 5½ per cent.; so that the average time the cures require is between four and five years.

The cures per annum in different asylums is computed in page 32 of the Parisian Report, and is thus given:

	Per cent.		Per cent.
"Hants	1·23	Kent	7·81
Colney Hatch	2·01	James Murray's	9·05
Hanwell	2·63	Oxford	10·35
Cheshire	4·60	Rainhill	10·59
Birmingham	5·47	Yorkshire	11·18
Prestwick	5·62	Lincolnshire	13·09
Wilts	6·36	Lancashire	15·79
Worcester	6·38	Parisian Asylum	13·27."
Bedford	7·70		

The cures per annum of course will vary considerably according to the chronicity of the complaint. Thus, at the Hampshire asylum, the cases are known to be mostly of very chronic character, and those at Hanwell are similar.

Dr. Hood's fourth chapter, *On the Influence of Education* in giving rise to Insanity, is short; and he states that the evidence to be derived from the tables of Bethlehem does not elucidate the subject.

In the eighth Report of the Irish Commission, 1857, page 12, is the following remark:

> "We have made an analysis of the state of education of the insane in poorhouses and asylums. In the former it appears there are 323 more or less educated, and 1476 illiterate; in the latter the numbers are, 2353 with some degree of education, against 1505 totally ignorant. The proportion of literate to illiterate in the general population of this country (Ireland) is 53 per cent. If we restrict the comparison to those in asylums, omitting the inmates in poorhouses, of whom a large majority are idiots, it would appear that education is in a much higher ratio among lunatics than in the community at large—a circumstance indicative of the fact that insanity, even among the humbler classes, is connected with intellectual development."

The above is a fair specimen of the floating opinions on the subject. But without stopping here to point out the fallacies of the above mode of argument, we will pass on to the next agent considered by Dr. Hood, in which, indeed, the above is involved.

The Influence of Residence.—This subject has received a large share of attention from writers, and there is some difficulty and obscurity in the question, and consequently much difference of opinion among them respecting it. The difficulty arises principally from the want of a clear definition of the terms used. It will be seen by the quotations below that a very wide scope is given to the signification of the term Residence. Dr. Hood says:

> "The conclusion arrived at by Sir Andrew Halliday, that insanity is more prevalent in agricultural than in manufacturing districts, will be found to be fully substantiated by the returns both of the Commissioners in Lunacy and the Poor-law Commissioners."

Sir A. Halliday, Dr. Hood proceeds to state, found that the proportion of insane to sane in twelve agricultural counties was 1 to 796; while in twelve counties in which the inhabitants were not principally employed in agriculture, the proportion was 1 to 1149.

> "Taking the same twelve agricultural and the same twelve non-agricultural counties selected by Sir Andrew Halliday, we find (writes Dr. Hood), from the reports of the Commissions of Lunacy, as follows:
>
> "*Agricultural Counties.*
>
> "In 1836, proportion of the insane to the population, 1 in 614.
> "In 1843, " " " 1 in 810.
> "In 1847, " " " 1 in 712.
>
> "*Non-Agricultural Counties.*
>
> "In 1836, proportion of the insane to the population, 1 in 1420.
> "In 1843 " " " 1 in 1109.
> "In 1847 " " " 1 in 939.
>
> "The same result is also shown by the Poor-law Commissioners' returns."

Before proceeding to criticise the above argument upon its own merits, we will proceed to give it all the advantage we can derive from authors; but it is worthy of note, that if the above is a sound argument as it relates to the causes of insanity, it must hold good also in its converse—viz., that since insanity is increasing in the manufacturing districts, that these districts are approaching more and more to the character of the agricultural. Whatever those rural agents are which cause insanity, and which constitute the difference between the agricultural and non-agricultural counties, they are becoming gradually equalized between the two.

We arrive at once, therefore, at the difficulty involved in the want of a proper definition of the term Residence. It is obvious that in the above quotation, the physical influence of the air of the country and that of the town is not meant, nor the pursuit of agriculture on the one hand and of manufacture on the other, because the selection of certain counties could not fairly represent one or other in a fair isolated condition. In the term Residence, as here applied, is included many influences both of a physical and mental character; and perhaps a better term for what is really meant would be that selected by Dr. Daniel Tuke, of York, in a paper on this subject in the October number of the 'Asylum Journal,' entitled, "Does Civilization favour the Generation of Mental Disease?" Dr. Hood arrives at the following conclusion on this point:

> "The explanation, indeed, is not at all obvious; still, we cannot but think that the human mind, with its high capabilities, is more likely to become deranged from having too little wherewith to exercise those capabilities fitly, than from having too much. If these faculties be not exercised, the mind will prey upon itself and become diseased, and surely this sad event is more likely to happen in the country than in town."

Dr. Thurnam's conclusions, deduced from his experience at the Retreat, near York, as quoted by Dr. Hood, corroborate the general opinion that, as Dr. Hood says, insanity is less likely to originate in large towns than in the country.

> "The fact that insanity prevails so much in agricultural districts," says Dr. Prichard, "indicates that its development is favoured by some of the circumstances connected with the condition of agricultural life."
>
> "It appears, however," writes Dr. Hood, "that MM. Brierre de Boismont, Renardin, Guislain, Parchopp (? Parchappe), and De Bouteville, have deduced an opposite conclusion from the experience of Belgium."*

Dr. Tuke, of York, in the paper referred to, on the other hand, says:

> "The *fact*, we believe, may be boldly denied. The statement is not established that more persons become insane in agricultural districts, proportionately, than in manufacturing ones. Instead of taking," continues Dr. Tuke, "the proportion of pauper lunatics to pauper population in the respective

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* Noble's Psychological Medicine, p. 270.

counties, an estimate has been made of the proportion of pauper lunatics to the total population of the county."

It must, however, be clear that in those counties where pauperism is the greatest, there will of necessity be a larger number of pauper lunatics in proportion to the general population. By selecting a group of agricultural counties, Dr. Tuke finds that there is an average of 18·37 lunatics to 1000 of the pauper population, and 26·40 per 1000 in a group selected by himself of manufacturing counties. In another group of counties, selected according to the numbers who signed the marriage certificate with marks—thereby showing the amount of education in those selected countiesDr. Tuke finds that in the uneducated group the average number of pauper lunatics per 1000 paupers was 14·81, while in the more educated counties it was 21·63 per cent.

But is this mode entirely free from objection? Should the comparison be made between the pauper lunatics and the pauper population only? Do not the same physical agents that produce insanity produce pauperism, and *vice versâ?* Moreover, it may be asked, can the pauper lunatics be considered to be an entirely analogous class to the paupers generally? It is well known that insanity, lasting as it does for a whole term of life, often is the sole cause of the subject becoming a pauper, and therefore that a much higher class become pauper lunatics than ever would become plain paupers. This is shown in various ways by the statistical evidence we have under review; but the Act of Parliament provides expressly for the admission of the class above the pauper into the pauper asylum, who afterwards are included in all the tables in the self-same category. The fallacies of the arguments used to determine this question appear to be chiefly the following:—1st. In the consideration of the effect of civilization, or of those agencies under the term Residence, in giving rise to insanity, not only should a more precise definition of the cause be settled upon, and this compound term be resolved into more simple elements, but also the form of the disease itself should be distinctly described; for example, in estimating the effect of an active mental existence, we should certainly distinguish between the cases or description of insanity found in conjunction. At present, in all the calculations, both lunatics and idiots are included under one general term.

It is not enough to trust to the large numbers which may be used to generalize upon, and hope for correct results by drawing averages; if we are comparing lunatics of one county with those of another, it is not enough to make any particular selection, and call one agricultural and another chiefly manufacturing, because in most counties the same condition may be variously combined with other physical or mental states. We should certainly take a survey of the whole. Again, it is not a correct mode to include lunatics and idiots together, as each of their states may be due to very opposite conditions.

The following Tables, made from calculations drawn from the last Report of the Commissioners in Lunacy and the Poor-law Commissioners, give the proportion of insane paupers to sane in every county. They also distinguish between the lunatic proper and the idiot, and give the relative numbers of the insane paupers to pauper population.

TABLE I. *One Lunatic or Idiot to Inhabitants.*

1.	Durham	1264	22.	Middlesex	662
2.	Stafford	998	23.	Westmoreland	645
3.	York, West Riding	974	24.	Devon	642
4.	Chester	940	25.	Nottingham	626
5.	Lancaster	911	26.	Surrey	613
6.	Cornwall	890	27.	Dorset	612
7.	Northumberland	868	28.	Bedford	603
8.	Monmouth	803	29.	Norfolk	595
9.	Cambridge	786	30.	Bucks	592
10.	Huntingdon	794	31.	Essex	579
11.	Warwick	783	32.	Southampton	559
12.	Lincoln	765	33.	Somerset	544
13.	Rutland	753	34.	Salop	532
14.	Derby	751	35.	Hereford	531
15.	Cumberland	754	36.	Hertford	513
16.	York, North Riding	718	37.	Leicester	511
17.	Sussex	707	38.	Northampton	508
18.	Kent	696	39.	Oxford	508
19.	York, East Riding	689	40.	Berks	464
20.	Worcester	676	41.	Wilts	460
21.	Suffolk	663	42.	Gloucester	454

Average 703

TABLE II. *One Lunatic to entire Population.*

1.	Durham	2123	22.	Southampton	1047
2.	Chester	1779	23.	Devon	1029
3.	Stafford	1767	24.	York, North Riding	1026
4.	York, West Riding	1678	25.	Kent	1025
5.	Northumberland	1666	26.	Suffolk	1025
6.	Cambridge	1541	27.	Norfolk	1025
7.	Westmoreland	1521	28.	Rutland	1004
8.	Cornwall	1482	29.	Dorset	973
9.	Derby	1394	30.	Nottingham	968
10.	Sussex	1389	31.	Essex	967
11.	Lancaster	1380	32.	Northampton	930
12.	Lincoln	1362	33.	Bucks	926
13.	Monmouth	1218	34.	Surrey	918
14.	Huntingdon	1156	35.	Hertford	872
15.	Warwick	1119	36.	Salop	847
16.	Worcester	1118	37.	Leicester	846
17.	York, East Riding	1088	38.	Wilts	845
18.	Hereford	1082	39.	Oxford	809
19.	Somerset	1069	40.	Middlesex	800
20.	Cumberland	1058	41.	Berks	792
21.	Bedford	1053	42.	Gloucester	705

Average 1110

TABLE III. *One Idiot to entire Population.*

1.	Middlesex	3848
2.	Durham	3142
3.	Rutland	3013
4.	Lancaster	2675
5.	Warwick	2632
6.	Cumberland	2500
7.	Huntingdon	2437
8.	York, North Riding	2383
9.	Monmouth	2353
10.	York, West Riding	2316
11.	Stafford	2308
12.	Cornwall	2273
13.	Kent	2162
14.	Chester	1993
15.	Suffolk	1880
16.	York, East Riding	1876
17.	Surrey	1843
18.	Northumberland	1813
19.	Lincoln	1742
20.	Worcester	1709
21.	Devon	1703
22.	Dorset	1650
23.	Bucks	1637
24.	Derby	1627
25.	Cambridge	1602
26.	Nottingham	1558
27.	Essex	1442
28.	Sussex	1438
29.	Salop	1432
30.	Norfolk	1416
31.	Bedford	1411
32.	Oxford	1361
33.	Leicester	1298
34.	Gloucester	1274
35.	Hertford	1246
36.	Southampton	1196
37.	Westmoreland	1119
38.	Berks	1116
39.	Northampton	1113
40.	Somerset	1106
41.	Hereford	1043
42.	Wilts	1010

Average 1917

TABLE IV. *One Lunatic to Paupers Relieved.*

1.	Cambridge	102
2.	Northumberland	81
3.	Somerset	76
4.	Durham	74
5.	Hereford	73
6.	Suffolk	71
7.	Sussex	69
8.	Dorset	68
9.	Westmoreland	65
10.	Essex	64
11.	Worcester	63
12.	Wilts	63
13.	Huntingdon	63
14.	Hertford	63
15.	Bucks	60
16.	Cornwall	59
17.	Bedford	58
18.	Monmouth	57
19.	Southampton	56
20.	Norfolk	56
21.	Lincoln	55
22.	Devon	55
23.	Chester	53
24.	Berks	53
25.	Oxford	52
26.	Kent	50
27.	York, West Riding	48
28.	Stafford	48
29.	Northampton	48
30.	Rutland	47
31.	Lancaster	45
32.	Surrey	44
33.	Leicester	43
34.	Cumberland	42
35.	Salop	40
36.	Nottingham	40
37.	York, North Riding	35
38.	Warwick	34
39.	York, East Riding	32
40.	Gloucester	30
41.	Derby	28
42.	Middlesex	21

Average 50

TABLE V. *One Idiot to Paupers Relieved.*

1.	Rutland	141
2.	Suffolk	139
3.	Huntingdon	133
4.	Dorset	117
5.	Monmouth	110
6.	Cambridge	106
7.	Bucks	106
8.	Kent	105
9.	Durham	103
10.	Middlesex	102

TABLE V. — *continued.*

11. Cumberland	100	27. Sussex	71
12. Worcester	97	28. Hereford	71
13. Essex	96	29. York, West Riding	67
14. Devon	92	30. Salop	67
15. Surrey	90	31. Leicester	66
16. Northumberland	89	32. Southampton	64
17. Lancaster	88	33. Stafford	63
18. Cornwall	87	34. Northampton	62
19. Oxford	82	35. Chester	59
20. York, North Riding	82	36. York, East Riding	56
21. Somerset	78	37. Gloucester	54
22. Bedford	77	38. Warwick	53
23. Wilts	76	39. Westmoreland	48
24. Norfolk	76	40. Hertford	37
25. Berks	75	41. Derby	33
26. Nottingham	74	42. Lincoln	31
Average	50		

In the first Table the counties are arranged according to the ratio which pauper lunatics bear to the general population of each county, the county in which the insane are in the lowest relative proportion being placed first. The number placed after the name of the county shows the fractional proportion that the insane bear to the sane in that county,—thus, in Durham the insane are equal to $\frac{1}{1264}$ of the whole population. In other words, there is one insane to every 1264 persons. In casting the eye down the Table, it will be at once apparent that the conclusion of Sir Andrew Halliday holds good as a general rule. The counties at the top of the list are certainly the more occupied in manufacturing pursuits; and those at the bottom, in which the insane bear a much larger proportion to sane, are chiefly agricultural counties, or counties removed from much mental activity. We find the average to be there, $\frac{1}{703}$ of the population are insane. Middlesex, however, is as near the centre of the list as possible, being the twenty-second in the first Table.

In the second and third Tables, the lunatic is distinguished from the idiot. Now, in the term idiot, which is extracted from the Report of the Commissioners, it is pretty certain all imbecile as well as congenital idiots are included, and it is highly probable that a larger portion are imbeciles in consequence of epilepsy; but however this may be, when the true lunatic is distinguished from the idiot, the relative position of several counties on the chart is greatly altered. Thus Middlesex—which represents, perhaps, the truest type of town influences, since the largest proportion of its inhabitants are resident in London—is found to stand fortieth on the list when lunatics only are estimated. It has, in other words, the largest number of true lunatics in proportion to the number of inhabitants, of any county, with the exception of two—viz., Berkshire and Gloucestershire; while, on the other hand, by a reference to the third Table, it will be seen that it has the fewest idiots, in proportion to the inhabitants, of all the English counties. This single fact at least shows the importance of distinguishing between the lunatic and imbecile when the effect of external agents is to be studied.

The fourth Table shows also that the number of pauper lunatics to sane paupers is nearly five times greater in Middlesex than in the county of Cambridge. But still, the just conclusion that is to be drawn from this is not that civilization increases the tendency to insanity, for, after all, who is to determine whether really this is the influence in action? All that is fairly deducible is that the inhabitants of towns are more prone to insanity, but are less liable to idiocy; that it is not just to attribute the increase of insanity to increased mental culture, to the state of mental activity that exists in large towns, we shall see hereafter. There are other influences equally more common to town life than to country, such as intemperance, vice, unwholesome food, impure air, &c. If the state of civilization gave rise to an increase of insanity, then the wealthier classes, as a rule, should be more prone to the disease. But what do we find? The estimated population of England and Wales in 1857 was 19,408,464, and at the same date there were, according to the Poor-law Commissioners, a total of 843,430 paupers. At the same period the Commissioners in Lunacy state that there existed in England and Wales 21,344 lunatics, of whom 16,657 were paupers and 4,687 not paupers. We have therefore the following equation:—

$$\text{Paupers}\left\{\begin{matrix}\text{Insane,} \\ \text{Sane,}\end{matrix}\right.\frac{16{,}657}{843{,}430}=\tfrac{1}{50}.$$

Or, in other words, a proportion of one-fiftieth of all paupers insane. On the other hand, the non-pauper class are easily estimated by deducting the number of paupers from the gross population, and the result will be as follows:—

$$\text{Non-paupers}\left\{\begin{matrix}\text{Insane,} \\ \text{Sane,}\end{matrix}\right.\frac{4{,}687}{18{,}565{,}034}=\tfrac{1}{3962}.$$

The proportion of the insane to the sane in these two classes is so great that, after making every conceivable deduction, there cannot but remain the conviction that the wealthier, and therefore surely the more educated and civilized, class, is less liable to insanity than the middle and lower classes.

Nevertheless, it appears to be equally true that in the larger towns, and especially in London, which we may fairly consider a centre of great mental activity, insanity prevails to the largest extent. May it not, therefore, be that if civilization is not productive of insanity in a direct, it is in an indirect manner? It would, then, be more correct to say that insanity follows in the wake of civilization—that its victims are the camp-followers in the intellectual march. In towns, and especially in the metropolis, we find the social condition of the inhabitants as it were in a polarized state; we find the highest intellectual phase of life and the lowest, the greatest luxury and greatest squalor, the most religious and the most abandoned, the avaricious and the spendthrift. Thus, while true civilization gives an immunity from insanity, there is still in the same region a fertile soil for its seeds to germinate,—the old condition, of the poison and its antidote growing side by side.

The Commissioners appointed to inquire into the state of the lunatic asylums of Scotland, in estimating the ratio of the insane to the general population, state that—

> "It appears that a Highland population contains more than three times the number of congenital cases of mental disease found in an equal lowland population."

In making any estimate, if these idiots are set down as cases of insanity, of course they would greatly tend to make it appear that the highland life was more conducive to insanity than the lowland.

The religious persuasion of patients is the next subject discussed. To us the statistics on this point have always appeared unsatisfactory; considerable pains have been taken to estimate the effect of this influence on the minds of persons with regard to the causation of insanity; the sources of error that beset the inquiry are so numerous, that very much more care appears to us still to be necessary to be given to the subject before any satisfactory conclusion can be arrived at; the difficulty is not with respect to religion as an exciting, but as a predisposing cause. In the first place, there is an obvious difficulty in ascertaining the opinions of patients on religious matters, and undoubtedly there is a great number of persons in all countries who have nothing more than a *pro formâ* attachment to any sect. In this country there are probably far more persons per cent. under actual religious impressions among those professing Romanism, than would be found per cent. among those professing Protestantism. It is certain that all that class of patients who have for years led a life without any observance of religion, if asked, would say they belonged to the Church of England, while the same class of persons in France would call themselves Roman Catholics; but such in estimating religion as a predisposing cause of disease manifestly ought to be excluded altogether. So far as statistics go, however, it would appear that any particular religious creed or profession cannot be considered to be a predisposing cause; while, most undoubtedly, powerful impressions on the mind on religious subjects are a frequent exciting cause of insanity in the same way that other powerful mental emotions are.

Probably neither Quakerism nor Infidelity nor Wesleyanism *per se* would render any one more liable to insanity. Yet it might be found that a powerful appeal to the mind from a preacher of any section would produce such effects on the mind as to give rise to the disease. To arrive at any accurate result on such a subject, it is necessary that we should know not merely how many persons call themselves of the Church of England, and how many Catholics, but we ought to know how many are actually under real religious impressions of any kind; we ought also to have the sects in the same position with regard to all other external influences; and until we can arrive at this, we must be content to state all violent emotional feelings are exciting causes, whether those emotions are excited by religious or other topics.

Statisticians also seldom neglect to tabulate *the social condition*, the number of single and married among their patients; in a medical point of view this appears to us to have little interest: unless at the same time we could be sure that by the word single or unmarried, the physical state of continence or virginity was actually meant, the inquiry can be of no scientific value. Certainly patients have been entered single who are mothers of several children, others as married who for years have lived as single.

The social condition thus affects, according to Dr. Hood's statistics, the chances of recovery. Of the married, 55·7 per cent. recovered; of the unmarried, 53·8 per cent.; of the widowed, 50 per cent.; while 8·2 per cent. of the married died, 4·2 per cent. of the unmarried, and 6·4 per cent. of the widowed.

These statistics are of more value to the inquiry and the advantage of social condition, perhaps, than to the subject of insanity; for if insanity is produced by mental distress, perhaps they show that there is more ease in the married state than in the single, and the word "blessedness" should now be allowed to attach itself to the former rather than to the latter condition.

The causes of insanity—by which it presumed are meant the immediate or exciting causes—are next considered by Dr. Hood, but our space will only allow of the general results.

Dr. Hood employs the usual classification into moral, physical, and hereditary.

Hereditary tendency was the assigned or apparent cause in 9·8 per cent. of the whole; being 8·3 per cent. in males, and 10·28 in females.

Moral causes—as anxiety, uncontrolled emotions, &c.—were assigned in 40·8 per cent., in males, and 32·7 per cent. among females; and the physical causes in 19·8 of males, and 21 per cent. in females.

The presumed causes of insanity in the patients in Bicêtre and Salpêtrière, are thus enumerated:—

"Physical causes, hereditary	24
Other physical causes	927
Moral causes	248
Unknown	284
Total	1438"

The chief physical causes are—old age, 168; abuse of alcoholic liquors, 114; bodily illness, 109; critical epoch in females, 107. Among the moral causes, 126 of the 248 cases are assigned to grief.

The difference in the numbers referred to hereditary tendency in this report and in the report of Dr. Hood, is remarkable, and most probably arises from some imperfect history of the cases in this respect.

Dr. Hood remarks that the cases for which the assigned cause is hereditary predisposition, are the most unsatisfactory of all:

> "While the per-centage of recoveries in both sexes is 51·5 per cent. when the cause of the disorder was of a moral character, and 33·8 when the cause

was of a physical character; the per-centage was only 14·6 when the only cause that could be detected was hereditary predisposition."

A favourite topic with all the writers of these Reports is the necessity and advantages of early treatment; this can be readily ceded, and it is probable that the effect of early remedial measures in all diseases is of equal consequence.

A more important consideration is the liability of the recovered patients to a second attack; 878 patients, out of 1797 admitted in ten years, were relapses, or were not cases of first attack—i.e., at the rate of 48·8 per cent. Dr. Hood remarks, that—

> "It is no doubt difficult to arrive at any correct conclusion upon the point; and hence the diversity of opinion that prevails. Esquirol considers that about 10 per cent. of the recoveries relapse. Pinel and Desportes fix a higher number, 17 per cent. Mr. Farr thinks 30 per cent. not too high."

At Hanwell, we learn that out of 100 cases admitted, 54 were cases of first attack, 20 cases not the first, 13 old cases discharged uncured from other hospitals (as Bethlehem and St. Luke's), and 13 the history is unknown. By the last Report of the Commissioners in Lunacy we learn that during the years 1854, 1855, and 1856, there were 22,646 cases admitted into the various asylums and licensed houses, and of these 14,468 were fresh cases, and 8178 cases of second attack of the disease. Out of 1586 admissions in Salpêtrière and Bicêtre, 268 were cases not the first attack, or at the rate of 16·89 per cent.; and they are thus classified—relapses 141, fresh attacks 29; out of 268 re-admissions, 170 occurred in patients who had been discharged less than one year.

> "The statistics of hospitals for the insane," says Dr. Thurnam, "lose in general much of their value from its not being known how far the reported recoveries have been permanent or otherwise; and it is therefore an important as well as a remarkable circumstance, that but little difficulty has been experienced in tracing, by inquiry or otherwise, with scarcely an exception, the history of every person who has been under the care of 'the Retreat,' either to the term of death, or to the date of this Report."

The process of reasoning, and the steps by which Dr. Thurnam arrives at his conclusion, are given in full; and are largely quoted by Dr. Hood, but they would occupy too much space here; it will suffice to give the general result at which Dr. Thurnam arrives:

> "In round numbers, then," says Dr. Thurnam, "of ten persons attacked by insanity, five recover, and five die sooner or later during the attack. Of the five who recover, not more than two remain well during the rest of their lives; the other three sustain subsequent attacks, during which at least two of them die."

With respect to the probable *longevity* of the insane, and the *average duration* of the malady, both in those who recover, and in those who die, the statistics of Bethlehem Hospital cannot, from the nature of the regulations in existence there, throw much light. The materials for arriving at a just conclusion on these really important points may, however, be found in the Statistics published by the Superintendents of the County Asylums. A complete series of the Hanwell Reports is before us, and the Tables are of the most elaborate kind. The asylum has now, it appears, been opened for a period of twenty-five years. The average number of patients under treatment has ranged from 200 up to 1020 in a year; so that not only has the time been long, through which the result can be traced, but the numbers have been sufficiently great to yield tolerably correct data. From the year of opening (1831) to the end of 1846, there were 2937 patients admitted. The sequel of these patients we have carefully followed through the Tables given in each year from 1831 to 1857, and the result of our investigation may be thus summed up:—For every 100 patients admitted into Hanwell, we find that at the end of five years there have

Died	31·49
Recovered	24·00
Have been removed	5·00
Remain under treatment . . .	39·51
Total	100·00

With respect to those patients who have been removed for various causes, only one thing can be said of them—viz., that they did not die; but whether they were curable or incurable, no record has been given; they consist of patients who have been sent to the Hanwell Asylum, which is the county asylum for Middlesex, and after a time have been found to have their legal settlement in some other county, and have therefore been transferred to their own county asylum. There is some difficulty in estimating the number of the patients thus removed, so as to approximate the result to ordinary circumstances; for in the year 1852, 100 patients were removed to the second asylum at Colney Hatch. The calculations have therefore been based upon averages of twenty-one years, instead of twenty-five, in order that these 100 cases might not be included, as they would form quite an exceptional circumstance to what occurs in other asylums.

From 1831 to 1846 inclusive, 2937 patients were admitted, and 705 left the asylum cured within five years of the date of their admission; and of these 705, 292 left within the first year, and 292 more before the close of the second year, 80 more before the end of the third year, and 41 in the fourth and fifth years. The first and second years are the most fertile of discharges by recovery, and the second year is equal to the first in this respect; this is important, since the rules of Bethlehem, on the statistics of which we have been chiefly engaged, have limited their results to the experience of the first year of treatment.

At the end of ten years, we find that each 100 patients has thus been disposed of:

Died	39·30
Recovered	25·16
Removed	4·30
Remaining	30·74
Total	100·00

At the end of fifteen years there will have

Died	46·42	per 100
Recovered	25·77	„
Removed	4·11	„
Remain	23·70	„

At the end of twenty years the following will be the result:—there will have

Died	53·12	per 100
Recovered	23·76	„
Removed	4·40	„
There will remain uncured	18·72	„

At the end of twenty-five years there will have

Died	59·70	per 100
Recovered	21·32	„
Removed	4·00	„
Remain uncured	14·98	„

The whole results are shown below in a tabulated form, thus:—

	At the end of				
	5 years.	10 years.	15 years.	20 years.	25 years.
Dead	31·49	39·80	46·42	53·12	59·70
Recovered	24·00	25·16	25·77	23·76	21·32
Removed	5·00	4·30	4·11	4·40	4·00
Remain	39·51	30·74	23·70	18·72	14·98
Total	100·00	100·00	100·00	100·00	100·00

Pursuing the inquiry in the track of Dr. Hood, we now arrive at the *history of the disease* itself; and one cannot help feeling that in passing from the personal history of the subject to the pathological part of the inquiry, we are entering from the confines of what is known, into what is still involved in much obscurity.

The definition of insanity is required of us by lawyers; but is a definition possible? are the lines of demarcation between sanity and insanity sufficiently distinct to be described? Is not one state shaded off into the other? Is there not between intellectual light and intellectual darkness a twilight, of which no one can say where it commences and where it ends?

The definition given by Dr. Bucknill is this, and it appears to be as good as any other, but it is questionable whether it would give much support to a medical witness under examination:

> "Insanity may be defined to be a condition of the mind in which a false action of conception or judgment, a defective power of the will, or an uncontrolled violence of the emotions and instincts, have, separately or conjointly, been produced by disease."

But as medical men, the question still remains for us—What is the nature of the disease? Are the forms into which it is almost universally divided—as mania, melancholia, dementia—philosophically correct? Is there a distinct cause and a distinct anatomical character, known or suspected, for each? And are the distinctions between these divisions exact or well-marked? Unfortunately they are not, so that all further statistics based upon these divisions are, to our minds, but little worth.

Under what category do those cases come which are known to every physician, in which a patient is for a period taciturn, despondent, and then for a period excited and talkative? Or under what head is a patient to be put who vociferates loudly that he is a sinner, that beats himself against the wall, tears his hair, and alternately with such actions, wrings his hands frantically with grief? When such a patient is comparatively quiet, one would be disposed, perhaps, to call him melancholic; when frantic, another would call him maniacal. There have been several attempts to bring the classification of the forms of insanity more into accordance with the advanced state of physiology. Dr. Noble's classification is such—into emotional, notional, and intelligential insanity; Dr. Henry Monro adopts this divisional form, further dividing each section into two—viz., with nervous depression, and with nervous exaltation.

These are classifications of phenomena manifested by something: it is not yet proved that they are the essential manifestation, or that they necessarily follow the same combination of causes in different individuals, or even in the same individual.

The Bethlehem Report only affords the concrete facts, that the patient was violent or dangerous, mischievous, tranquil, &c. In the Report of Hanwell, 1856, the disease is classified under five heads,—thus, out of 1023 patients, 463 are placed under mania, the sexes being almost equally affected. Melancholia, 162: men, 56; women, 106. So that it appears the female is much more prone to a despondent state than the male in insanity. Incoherence is the third head or division, in which were 31 males and 93 females. Probably some would include this division under the head of mania. Imbecility affects 92 males and 101 females; dementia, 23 males and 46 females. There are at Hanwell 439 males and 534 females; the surplus of females appears to be due to the greater prevalence of melancholia and incoherence. In Salpêtrière and Bicêtre there remained, at the end of the year 1855, 2117 patients, of whom 1624 were *fous*, 268 idiots and imbeciles, 225 epileptics—750 of the 2117 were males, and 1367 females.

Before quitting this part of the subject, we cannot help remarking, that what is still a desideratum in medicine with regard to insanity, is a carefully collected series of cases scientifically observed, without previous mental bias; and a philosophical analysis of them. Such a work must be productive of valuable results. The terms psychiatrics and psychiatricians have lately been much in vogue among the specialty of mad-doctors, but insanity has not passed out of the realms of the physician. It is true that the physician may require some familiarity with psychology, but in investigating disease, the first thing necessary is the collection of facts; and though the operations of the mind are equally facts as much as any series of actions in the physical world, yet there is this difference—the one set of facts is exterior, the other interior: that which is outward can be observed by two individuals at the same time, but the inward can be only known to the subject. We can, it is true, reason out motives by analogy,—that is, from the conduct of others we may, by practice and tact, guess at the train of inward actions that preceded the outward manifestation. But even in healthy action, how often do we misconstrue the inward motive—how frequently do we ascribe a special line of conduct to wrong motives which really have been dictated by right! And so it must be with our estimates of the motives of the actions of the insane. M. Falret, in his 'Leçons Cliniques,' points out the different state of mind which may lead to manifestations closely allied in character, and which have been, in fact, included in one name. He instances the form of malady called kleptomania and homicidal monomania, which, says he, can scarcely ever be considered as the modification or exaltation of an inherent propensity existing naturally in all. For example, one patient may be induced to commit murder for the sake of revenge, another in obedience to some delusion. There are patients who would kill their own children, that they might go to heaven, or that they might escape the cares of the world. Again: patients refuse food, some from a wish to destroy themselves, others to preserve their life, believing that the food is poisoned. In making observations of such symptoms, care should be taken to describe the concrete fact, without attempting to find a motive—to keep to what is certain, and not pass to what must be conjecture. Undoubtedly, psychological observations are useful, but only so far as they are true. The object and end of our art is, after all, restoration of the patient to bodily health. If the body can be put into order, the mind doubtless will be restored to its healthy action; the forms—the Protean forms which the disease assumes—may, however, aid us in prognosis. The mad-doctor ought in an especial manner to be a physician, for he has particularly to be guided by physical signs, and in many instances almost exclusively by them. In this, indeed, is the only difference in the specialty, so far as diagnosis is concerned.

Dr. Hood's chapter on the *Morbid Appearances after Death* is the next which presents itself, and is the scantiest of all. The subject is dismissed in three pages.

The Medical Officers of Colney Hatch publish in their Annual Report a summary of post-mortem appearances, but there is in scarcely any collection of recorded autopsies any attempt to separate the cases according to the phenomena presented during life A series of autopsies of insane persons is to be found in 'The Psychological Journal,'* by Dr. Webster; but one of the most original investigations is that of Dr. Skae, of Edinburgh. In an appendix to the 'Annual Report of the Royal Edinburgh Asylum for 1854,' is a very elaborate and valuable abstract of the cerebral pathology of 411 cases, as observed by Dr. Skae during seventeen years. In this abstract, Dr. Skae has tabulated the appearances observed in the brain: the most frequently occurring of which are opacity and thickening of the arachnoid; subarachnoid; serous effusion; serous effusion into sac of arachnoid; congestion of membranes; serous effusion in lateral ventricles; dark colour of the grey matter which was noticed in about one-fifth of the whole; and Dr. Skae thus comments on this table of pathological changes:—

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* Vols. vii. and viii., also Med.-Chir. Trans., vol. xxvi. p. 374, vol. xxviii., p. 427, and vol. xxxii., pp. 115—120.

> "The general conclusions to be derived from the preceding abstract, are, that in a large proportion of the deaths, well-marked appearances were found indicating increased vascular action, or slow inflammatory processes affecting the membranes of the brain, and producing thickening and serous effusion.
>
> "These appearances were most constant and most distinct in the deaths from general paralysis, where there was also found a peculiar kind of *softening of the grey substance* of the brain, and on examining this part of the brain under the microscope, the cells of which it is principally composed appeared to be enlarged and altered in form. In these cases, adhesion of the membranes to the surface of the convolutions was present in all instances where there was not such a quantity of serous effusion interspersed to prevent it; in stripping off the membranes, small layers of grey matter were stripped off with them, particularly on the lateral surfaces of the hemispheres.
>
> "With the exception of the morbid changes last mentioned, which are limited to cases of general paralysis, all the other morbid appearances are found very frequently in the brains of persons who have died of other diseases, and without any mental affection. And on the other hand, cases are not unfrequently to be met with in the dead-house of the asylum, of patients who had exhibited during life, for many months or even years, all the symptoms of raving madness, and in whose brains the morbid appearances described are altogether wanting, and in which the brain could not be distinguished from that of one who had died in all the vigour of a sound mind."

These considerations induced Dr. Skae to examine the brain more minutely, and by other means than those in ordinary use; "feeling that pathological investigations are not to be abandoned until we have exhausted all our means of observation." Accordingly Dr. Skae commenced a series of experiments by weighing the brain, by measuring the thickness of the grey matter, by Durand Fardel's test of pouring a stream of water on the surface of the cerebral matter, and more lately, by taking the specific gravity of the grey and white substance of different parts of the brain. Dr. Skae has as yet only published the observations and deductions from the weight and the specific gravity.

With respect to the weight, Dr. Skae's observations extend over 199 cases—98 males and 101 females; which he has compared with the weights collected by Dr. Reed and Dr. Peacock.

The comparison, remarks Dr. Skae, establishes a strong presumption that the absolute weight of the brain is increased in the insane; this increase of weight appears to depend chiefly upon an increase in the weight of the cerebellum.

> "In another table, the ratio between the cerebellum (with the pons and medulla) and the cerebrum is given at the different ages distinguished. . . . In almost every instance the cerebellum in the insane is heavier in relation to the cerebrum than it is in the sane. From the average of the entire number, the cerebellum was found in the males to be as 1 to 6·748 in the insane, and as 1 to 7·06 in the sane; and in the females as 1 to 6·64 in the insane, and only 1 to 7 in the sane: the cerebellum, therefore, is considerably heavier in relation to the cerebrum in the insane.

The following Tables, made from calculations drawn from the last Report of the Commissioners in Lunacy and the Poor-law Commissioners, give the proportion of insane paupers to sane in every county. They also distinguish between the lunatic proper and the idiot, and give the relative numbers of the insane paupers to pauper population.

TABLE I. *One Lunatic or Idiot to Inhabitants.*

1.	Durham	1264
2.	Stafford	998
3.	York, West Riding	974
4.	Chester	940
5.	Lancaster	911
6.	Cornwall	890
7.	Northumberland	868
8.	Monmouth	803
9.	Cambridge	786
10.	Huntingdon	784
11.	Warwick	783
12.	Lincoln	765
13.	Rutland	753
14.	Derby	751
15.	Cumberland	754
16.	York, North Riding	718
17.	Sussex	707
18.	Kent	696
19.	York, East Riding	689
20.	Worcester	676
21.	Suffolk	663
22.	Middlesex	662
23.	Westmoreland	645
24.	Devon	642
25.	Nottingham	626
26.	Surrey	613
27.	Dorset	612
28.	Bedford	603
29.	Norfolk	595
30.	Bucks	592
31.	Essex	579
32.	Southampton	559
33.	Somerset	544
34.	Salop	532
35.	Hereford	531
36.	Hertford	513
37.	Leicester	511
38.	Northampton	508
39.	Oxford	508
40.	Berks	464
41.	Wilts	460
42.	Gloucester	454

Average 703

TABLE II. *One Lunatic to entire Population.*

1.	Durham	2123
2.	Chester	1779
3.	Stafford	1767
4.	York, West Riding	1678
5.	Northumberland	1666
6.	Cambridge	1541
7.	Westmoreland	1521
8.	Cornwall	1482
9.	Derby	1394
10.	Sussex	1389
11.	Lancaster	1380
12.	Lincoln	1362
13.	Monmouth	1218
14.	Huntingdon	1156
15.	Warwick	1119
16.	Worcester	1118
17.	York, East Riding	1088
18.	Hereford	1082
19.	Somerset	1069
20.	Cumberland	1058
21.	Bedford	1053
22.	Southampton	1047
23.	Devon	1029
24.	York, North Riding	1026
25.	Kent	1025
26.	Suffolk	1025
27.	Norfolk	1025
28.	Rutland	1004
29.	Dorset	973
30.	Nottingham	968
31.	Essex	967
32.	Northampton	930
33.	Bucks	926
34.	Surrey	918
35.	Hertford	872
36.	Salop	847
37.	Leicester	846
38.	Wilts	845
39.	Oxford	809
40.	Middlesex	800
41.	Berks	792
42.	Gloucester	705

Average 1110

TABLE III. *One Idiot to entire Population.*

1.	Middlesex	3848	22.	Dorset	1650
2.	Durham	3142	23.	Bucks	1637
3.	Rutland	3013	24.	Derby	1627
4.	Lancaster	2675	25.	Cambridge	1602
5.	Warwick	2632	26.	Nottingham	1558
6.	Cumberland	2500	27.	Essex	1442
7.	Huntingdon	2437	28.	Sussex	1438
8.	York, North Riding	2383	29.	Salop	1432
9.	Monmouth	2353	30.	Norfolk	1416
10.	York, West Riding	2316	31.	Bedford	1411
11.	Stafford	2308	32.	Oxford	1361
12.	Cornwall	2273	33.	Leicester	1298
13.	Kent	2162	34.	Gloucester	1274
14.	Chester	1993	35.	Hertford	1246
15.	Suffolk	1880	36.	Southampton	1196
16.	York, East Riding	1876	37.	Westmoreland	1119
17.	Surrey	1843	38.	Berks	1116
18.	Northumberland	1813	39.	Northampton	1113
19.	Lincoln	1742	40.	Somerset	1106
20.	Worcester	1709	41.	Hereford	1043
21.	Devon	1703	42.	Wilts	1010

Average 1917

TABLE IV. *One Lunatic to Paupers Relieved.*

1.	Cambridge	102	22.	Devon	55
2.	Northumberland	81	23.	Chester	53
3.	Somerset	76	24.	Berks	53
4.	Durham	74	25.	Oxford	52
5.	Hereford	73	26.	Kent	50
6.	Suffolk	71	27.	York, West Riding	48
7.	Sussex	69	28.	Stafford	48
8.	Dorset	68	29.	Northampton	48
9.	Westmoreland	65	30.	Rutland	47
10.	Essex	64	31.	Lancaster	45
11.	Worcester	63	32.	Surrey	44
12.	Wilts	63	33.	Leicester	43
13.	Huntingdon	63	34.	Cumberland	42
14.	Hertford	63	35.	Salop	40
15.	Bucks	60	36.	Nottingham	40
16.	Cornwall	59	37.	York, North Riding	35
17.	Bedford	58	38.	Warwick	34
18.	Monmouth	57	39.	York, East Riding	32
19.	Southampton	56	40.	Gloucester	30
20.	Norfolk	56	41.	Derby	28
21.	Lincoln	55	42.	Middlesex	21

Average 50

TABLE V. *One Idiot to Paupers Relieved.*

1.	Rutland	141	6.	Cambridge	106
2.	Suffolk	139	7.	Bucks	106
3.	Huntingdon	133	8.	Kent	105
4.	Dorset	117	9.	Durham	103
5.	Monmouth	110	10.	Middlesex	102

The use of baths, warm and cold, is generally approved of. A prolonged warm bath was much recommended, on account of its sedative influence, at one time; but the high character it once received does not appear to be maintained. The shower-bath is used in nearly every asylum, and its power of allaying excitement generally believed. It also appears to have a special influence on the malady. No doubt the use of the bath is unpleasant to some, but by no means to all patients; the unpleasantness of the remedy ought not to form any part of the prescription when this bath is ordered. It is not the moral, but the physical effects for which the bath is indicated.

With respect to *Diet*—

> "Experience has shown," says Dr. Hood, "the necessity of providing a liberal diet for the insane. Dr. Thurnam very carefully investigated this point, and with a desire to arrive at some general conclusion as to the influence of diet upon recovery or death, he examined the statistics of several county asylums in England."
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> "In the three asylums with the more liberal diet, we find," says Dr. Thurnam, "that the recoveries averaged 43·7 per cent., and that the mean mortality was 9·35 per cent.; whilst in the four institutions in which the diet was less liberal and nutritious, the recoveries only averaged 36·75 per cent., and the mean mortality was 14·54 per cent."

Moral Treatment.—Under this head is included the once all-important question of restraint and non-restraint. The system of treatment without the employment of mechanical restraint was inaugurated more than ten years ago, and therefore the principle scarcely belongs to the present Review. In England it may now be said to be fully and firmly established; it would be of little use, therefore, to re-open the subject. A considerable amount of the literature connected with the special department of medicine has been devoted to the discussion of this certainly important question; but our task will be chiefly confined to that of the historian, and to a few remarks connected with matters about which there appears to be some misconception on the part of the public and the profession. It has occurred to the writer to be asked, privately, and in a kind of doubting confidential tone, whether there was not really some mode of coercion used. When it is asserted that the non-restraint system is pursued, say such persons, we of course understand that, as a rule, the patients are not restrained, or only for very short periods; and he has even been asked to show the chair or rotatory engine used. Others have imagined that the patient has been pretty well initiated to obedience on his admission by being nearly half-drowned in a cold bath. Such nonsense will appear to those conversant with the actual state of practice, too absurd to mention, and too ridiculous to require a refutation. It may be as well to state generally, perhaps, that by the non-restraint system is meant an entire absence of anything like coercion, either by mechanical means, by punishments, or by threats of any kind whatever.

There are now about 14,000 lunatics under treatment in our large English county asylums, and there is less hardship or severity towards any of these than is practised towards the scholars in our public schools. It is pretty certain that if a single strait-jacket were called for, no such a thing could be produced by any of the officers having charge of the treatment of these 14,000 lunatics; and this fact is at once an answer to the question whether the system of non-restraint can be carried out, and whether or not mechanical restraint can be wholly abandoned. Mechanical restraint, we learn from Dr. Hood, was not wholly discarded at Bethlehem till 1850; the use of restraint lingered there as long as in any large English asylum—it was entirely suppressed only on the appointment of Dr. Hood, from whom we learn that so late as 1846 there were as many as sixty-nine instances of the employment of mechanical restraint.

In the year 1854, the Commissioners in Lunacy of England issued a circular to the superintendents and proprietors of all the asylums, requesting their views upon the subjects of restraint and seclusion at that period. Twenty-two of the chief county asylums had abandoned the use of restraint, and five had not. Since that date some of these five asylums have passed under other superintendence, and at the present day there is not, it is believed, a single county asylum where mechanical restraint is maintained as a principle. The Commissioners also at the same period received answers from many proprietors of private asylums, one-half of whom were found to be advocates of mechanical restraint. The superintendents of the public asylums were therefore for non-restraint, and the superintendents of the private asylums advocated restraint. There were in that period nearly 13,000 patients in the county asylums, and about 5,000 in the private asylums. The key to this difference of opinion is suggested by the Commissioners themselves:

> "For ourselves, we have long been convinced, and have steadily acted on the conviction, that the possibility of dispensing with mechanical coercion in the management of the insane, is, in a vast majority of cases, a mere question of expense." (Eighth Report, p. 42.)

But could the superintendents of the county asylums have had any undue bias in forming their opinions against restraint? It was known, certainly, as stated in the above extract, that the Commissioners had "long been convinced;" but the superintendents of the public asylums are much more independent of the Commissioners than the proprietors of the private asylums. Many of the advocates of non-restraint had nothing to do with the inauguration of the milder system, and therefore could not have been personally interested in the success of either.

The controversies connected with the introduction of non-restraint have now nearly ceased in this country; but there is one accusation brought by the advocates of mechanical restraint which requires a remark. They accuse their opponents of employing seclusion to an unwarrantable extent, and also occasionally of employing nauseating and depressing medicinal agents.

That any of the advocates of non-restraint employ such means more, or as much, or less, than those who use mechanical restraint, appears to be entirely without proof.

Mechanical restraint is still employed, however, in most, if not every other country, but England. In Scotland, the Scotch Commission report:

> "Personal restraint, by application of the strait-waistcoat, or of straps or muffs, is *almost entirely* banished from the chartered asylums; but we have reason to think that seclusion for long periods is frequently used."

In Ireland, the Commissioners have recently addressed a circular to all the superintendents of asylums under their inspection, requesting to be informed if mechanical restraint is employed. They received nineteen replies to their questions, from which it appears that some form of mechanical restraint is still used in all but three—viz., Maryborough, Sligo, and Killarney.

In France, Germany, and every other country of which we have received reports, mechanical restraint continues to be extensively employed, both in the public and private establishments. In America, the arguments for the abolition of mechanical restraint are treated with scarcely becoming temper; but what but good can be intended by those who would desire to see restraint abandoned?

> "The sentiments of American psychologists at the present day may be found in the Report of the tenth meeting of the Medical Superintendents of American Institutes for the Insane, published in the 'Journal of Insanity' for July, 1855. In a discussion following the reading of the paper upon the Non-restraint System, the conclusions of the writer, unfavourable to the abolition of restraints, were concurred in by all the members present."*

It will be asked, Do the advocates of non-restraint insist that there is no exception to be made to the rule? On this they appear to be almost unanimously agreed also, that most certainly cases will now and then occur which require and necessitate a mechanical restraint, but that such cases are of extremely rare occurrence. These cases are chiefly those requiring the application of surgical dressings, and which the patients are disposed to disturb or remove. But this is always to be borne in mind—in making an exception to the general rule—that the profession of the principle of non-restraint by an institution is of itself a great moral remedy, and it should not therefore be readily departed from.

Seclusion.—It has been charged against the advocates of non-restraint that they make too great a use of seclusion. The Commissioners in Lunacy, with their questions on the use of restraint, included others also on the use of seclusion. There appears to be a considerable misapprehension—we will not say misconstruction—of what the advocates of non-restraint mean by seclusion. The restrainers, in their advocacy of the strait-jacket, say that it allows the patient more freedom than seclusion. They intimate that to seclude a patient is meant to shut him up in a small dark cell or room, denuded of its furniture, and with the shutters closed, and that this is practised very extensively. Dr. Sankey, in his report of the female department of the Hanwell Asylum for 1855, says:

> "Seclusion, or the temporary confinement of a patient in her bed-room, is, without question, a powerful remedial agent. Its effect in nine cases out of

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* Journal of Insanity, Jan. 1857.

ten is of a soothing character. If the opposite effect be produced, its use is at once contra-indicated. The power of seclusion to allay excitement consists in its capability of removing the patient beyond the sphere of the action of all exciting causes."

For the purposes of seclusion, the patient's own bed-room is usually selected. In most cases, after a short period the patient becomes quiet, and often lies down.

In connexion with the subject of moral treatment, there is another matter which is much misunderstood by the public and profession generally, but about which all this class of specialists are well agreed—and that is, the proper functions and necessary powers that should be given to the superintendents of asylums. The superintendents themselves say that their authority should be paramount to everything. The public are incredulous, and believe that a mere desire for power dictates such an opinion. The interests and well-doing of the patients are so connected with this matter, that it deserves especial mention. Intimately connected with this is the construction of the asylum or hospital in which the treatment is to be carried out. The same conclusion with respect to the powers of the superintendent-physician was arrived at by a commission of inquiry in America. The Commissioners in Lunacy have also frequently expressed their opinion to the same effect. But the weight of authority will be less convincing than an enumeration of some of the reasons that have led to this conclusion. They may be thus briefly stated. The first indication in the treatment of any disease is, if possible, to throw the affected organ out of work, to procure rest for it. If it be a bone that is broken, we place it in splints; if it be the digestion, we prescribe articles known to digest easily, and so on. The brain being affected, the first indication is to obtain mental rest for the patient, to secure perfect freedom from all irritating agents. Now, with the mental organs, these irritating agents are, external objects generally, and not only objects, but actions; influences, both external and internal; and all the varied matters about which the mind can be occupied. In fact, there is not a single rule or regulation of the house that may not happen to be a special annoyance, and therefore an irritant, to some one. Whether that rule relate to the conduct of the patient himself or others, whether it relate to the order of the house, the diet, the time of rising or going to bed, the position of a piece of furniture, the longings of his appetite, his cravings, his disgust, his fears, suspicions or hopes, all have to be studied in the conduct of the house; and more,—when an alteration is necessary, it is absolutely essential that it should be promptly made.

"The principle which decides this question,—i.e., whether the medical officer shall be the supreme director of the asylum—is this (says M. Falret): Are the matters connected with the administration of the affairs of an asylum of a nature to exercise a moral influence upon the patient, or are they not? If they are, it is evident that these measures should be within the domain of the physician. But can any one doubt it? All the circumstances by which the patient is surrounded constitute an essential part of the moral treatment, and it is only on the condition that the physician have the entire disposal and conduct of these, that he can effectually oppose and antagonize these varieties of means to the varieties of disposition and character of his patients."

The duty of the alienist physician is not merely to prescribe,—a surgeon is not content to order the amputation of a leg or the adjustment of a splint, but he performs the necessary operation himself: so must the superintendent of the asylum of the insane. His presence, his support, his assurance of sympathy, his friendship and interest, are what the patient looks for and rests upon; he therefore should be always at hand to administer to each patient himself.

Until these matters are regularly understood, the insane cannot be properly cared for; and while the profession generally entertain crude ideas on this very important subject, it is not surprising to find that the public and the magistracy, with whom the general control of all matters connected with asylums is vested, incredulous. The superintendents themselves are perhaps placed out of court, on account of being, or being supposed to be, interested parties; but if, when other medical men are appealed to, they side against the superintendents, the specialist may write in vain—the opinions and labours of Pinel, Esquirol, Conolly, the Committee of American Physicians, and those of the Commissioners in Lunacy, frequently expressed, become abortive.

This matter has been dwelt upon by us at some length for two reasons. In the first place, because the opinion formed by ourselves from reading the best authors and from actual experience, is not in accordance with our own first impressions, and, as we believe, with the first and crude impressions of the medical public generally; and secondly, a right understanding of the case by the profession is really of importance to the success of the labours of the specialist. The alienist physician requires the support of his professional brethren rather than his opposition with the public in this matter.

From a misunderstanding of these things it is that we see such monster establishments erected as those of Colney Hatch and Hanwell, and to both of which it is, we perceive by the last Report, proposed to add. The fault of this is due to the Commissioners in Lunacy, with whom alone rests the power of giving or withholding consent to the construction of such unwieldy establishments. And that the Commissioners are fully aware of the evils that result from asylums of such gigantic proportions, and that they concur in the opinions expressed above, is evident from a letter addressed by themselves to the Committee of Visitors of Hanwell, published in their last Report:

> "The Board have always been of opinion that asylums beyond a certain size are most objectionable. Experience has proved, that besides not offering those pecuniary advantages in construction or working which might reasonably be expected in some instances, the original cost of the building, and also the rate of maintenance for patients, have been found to be even higher than in smaller establishments, without any corresponding advantages to the patients, and certainly with fewer means towards their medical treatment and cure."*

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* Letter of the Commissioners to Committee of the Hanwell Asylum.

The certain size to which the Commissioners would limit the asylums is thus expressed in the same letter:

> "It is moreover a fact within the experience of the Commissioners, that the due supervision and constant attention to the mental and bodily health of lunatic patients, individually requires, and should exact, such a limitation as the medical officer responsible for the charge can find fairly compatible with his individual powers and duties."

It is clearly the opinion of the Commissioners, therefore, that each asylum should be governed by one superintendent, and that that one should be a medical man; and considering that, for the purposes of using every external agent as a remedy, every transaction should be known to the physician, the limit of the establishment must evidently not extend beyond his individual powers: unless he knows every operation, every work, every occupation going on, how can he take advantage of them to employ them for the amusement or diversion of the patient's mind? The size considered to be proper by different writers varies from 200 to 450 beds; it is obvious, however, that the number of patients that one man could treat must depend somewhat upon the character of the cases. A Special Commission was formed to consider this particular subject in America, and a series of resolutions were agreed upon. The highest number considered proper for one building to accommodate was fixed by them at 250, but they considered 200 a preferable maximum.*

Esquirol, in the early period of his life, was called upon to report to the French Government upon the proper number of patients that should be accommodated in one asylum. His first report fixed upon from 400 to 500 patients as the utmost limit; but in a foot-note dated twenty years subsequently, he says, "My subsequent experience convinces me that this number is much too great; I would reduce it one-half."

Independent of the disadvantages connected with the working of a large establishment, divided into numerous separate departments, there is another evil, which is due to a false economy, or perhaps to a growing desire prevalent for centralization, and that is, the construction of but one large asylum for each county, and which, if placed in the most central position that could be found, must necessarily be very remote from the homes of those patients who live near the borders. Besides this, there is another anomaly connected with the law as at present worked. The asylums are constructed by the county rate; certain boroughs do not contribute to the rates of the counties in which they are situated, and consequently the insane poor are not entitled to admission into the county asylum, though it may be situated close at hand.

This evil has been frequently mentioned by the Commissioners in Lunacy, but little appears to have been done at present to remedy the evil. The Commissioners, in the Report for 1856, say, in speaking of lunatics belonging to boroughs,

"At present, large numbers of these patients are sent to licensed houses far from their homes, to distances sometimes exceeding, and often scarcely less, than 100 miles, which their relations and friends are unable to travel. The savings of the labouring poor are quite insufficient in most cases to defray the expense of such journeys, and their time (constituting their means of existence) cannot be spared for that purpose. The consequence has been, that the poor borough lunatic has been left too often to pass a considerable portion of his life, and in some cases to die, far from his home, and without any of his nearest connexions having been able to comfort him by their occasional presence. The borough of Portsmouth not contributing to the expense of erection of the county asylum, send their patients to Camberwell House, near London, a distance of nearly 100 miles, and they pay eleven shillings a-week with each; the county asylum is within a few miles of Portsmouth, and would take them for thirteen shillings a-week; and it should be borne in mind that the eleven shillings must yield a profit, and thirteen not."

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* Psychological Journal, vol. vii. p. 298.

Hitherto we have scarcely alluded to the 'Report of the Scottish Lunacy Commission,' excepting in a very cursory manner. Before these pages meet the public eye, the Legislature, it is hoped, will have put into operation a proper remedy for the state of things brought to light by the Commissioners.

Many remember the speech of Lord Shaftesbury (at that period Lord Ashley) on the night of Tuesday, July 23rd, 1844. Lord Ashley drew such a picture of the state of lunatics in England, as immediately to attract public attention to the matter, and the constitution of the present Board of Commissioners in Lunacy was the result. The most lamentable thing connected with the Scotch Commission is, perhaps, that it should be required at all thirteen years after the reforms in England; that while England was in advance of the rest of the civilized world, in close proximity there existed a state of things disgraceful to any country. But happily the greatest abuses were not medical; the direction of the affairs of lunatics was not in the hands of the medical profession. It is true that there existed great neglect in the medical administration of the Scotch private asylums, but this was not the fault of the medical man. He in most instances was called in for a special purpose, and the direction of the management of the house was in the majority of cases in lay hands, and often under the jurisdiction of women.

It has been said that a similar state of things formerly existed in England, and that the Commissioners in Lunacy put an end to them. What, it will be asked, were the powers given to the Board by which they were enabled to accomplish such benefit? the powers were peculiarly English—the power of reporting—a power which may be described to be that of writing a severe criticism without exposing themselves to an action for libel. This, indeed, was all that they possessed with regard to the public asylums; but with the private asylum they have the power or means of cancelling a licence; towards the private asylum the authority is great, and towards the public asylum it has been found sufficient. With few exceptions the visits of the Commissioners are received by the governing bodies as valuable and useful, and they are welcomed with every courtesy. With some few they are rebuffed, and with these their power is merely nominal. As an instance of their powerlessness to act, we may refer to some correspondence that is published by the Committee of Visitors of the Hanwell Asylum in their last Report, in which it will be seen that the convictions of the Commissioners were strongly expressed for one mode of action—viz., against the proposed enlargement of the Hanwell Asylum; and the Committee were as strongly determined to enlarge the building; and after one or two letters, in which the parties hold an argument, without having first settled upon the true definition of the terms "Medical treatment," and upon the signification of which terms the Commissioners and Committee were totally at variance, the Commissioners seem to be obliged to yield. The Commissioners state

> "That they continue to be of opinion that to build a third asylum would be the most desirable course; but that, observing the very decided conclusion in favour of the opposite course at which the governing bodies have arrived, they forbear to press further at this time views which they see to be impracticable."

The argument, no doubt, appeared to the Committee to be entirely with them, and is stated at some length and subtlety; but the fallacy of the whole is based upon the misconception of what is medical treatment, and which they hold in common with most of the public, and on which we have already dwelt at some length. The Committee would define medical treatment to be the administration of therapeutical agents, the Commissioners agreeing with an able French writer, that "Toutes les circonstances dont une malade est environné constituent une partie essentielle du traitement."

Review IV.

1. *Traité des Dégénérescences Physiques, Intellectuelles et Morales de l'Espèce Humaine, et des Causes qui produisent ces Variétés Maladives.* Par le Docteur B. A. Morel, Médecin en Chef de l'Asile des Aliénés de Saint-Yon (Seine Inférieure), &c. &c. Accompagné d'un Atlas de 12 Planches.—*Paris*, 1857. pp. 700.

A Treatise on the Physical, Intellectual, and Moral Degenerations of the Human Race, and upon the Causes which produce these Morbid Varieties. By Dr. Morel, First Physician to the Asylum for Lunatics at Saint-Yon, in the Department of the "Seine Inférieure."—*Paris*, 1857.

2. *On the Transmission from Parent to Offspring of some Forms of Disease and of Morbid Taints and Tendencies.* By James Whitehead, M.D., F.R.C.S., M.R.I.A., &c. &c. Second Edition.—*London*, 1857. 8vo, pp. 432.

3. *The Races of Man: a Fragment.* By Robert Knox, M.D., Lecturer on Anatomy, and Corresponding Member of the National Academy of Medicine of France.—*London*, 1850. pp. 479.

Notwithstanding that a rigid analysis of the axiom, *la vie est l'ensemble des fonctions qui résistent à la mort* (with which Bichat opens his admirable tractate*), will demonstrate therein a vagueness of expression opposed to the definiteness required in the formal enunciation of a general law, we are satisfied that Bichat's idea contains within it the germs of the nearest approach we have as yet been able to make towards a satisfactory proximate definition of the term "life." A study of the paragraph following the axiom in question, and which is a commentary upon it, will sufficiently vindicate the truth of our remark. "Such is, in fact," writes the great physiologist, "the mode of existence of living bodies, that everything surrounding them tends to their destruction." In this existence is involved a resistance to or a force opposing such destruction—a force known to us only like other forces, by its phenomena, and in the sum of whose phenomena is witnessed the expression of the "life." The more perfect working out of the truth included in Bichat's proposition, and its rigorous exposition, can be examined and weighed by those willing to follow out a train of close yet lucid reasoning, who will refer to the third part (general synthesis) of Mr. Herbert Spencer's 'Principles of Psychology,'† where life is defined as "the definite combination of heterogeneous changes, both simultaneous and successive, in correspondence with external coexistences and sequences." (p. 368, *op. cit.*) It will be further seen that the *degree* of life varies with this correspondence, which latter is witnessed progressing from low to higher types of vitality, the highest life being found in the most complicated environments, and the lowest in environments of unusual simplicity. Perfect correspondence would be perfect life.

> "Were there no changes in the environment but such as the organism had adapted changes to meet, and were it never to fail in the efficiency with which it met them, there would be eternal existence and universal knowledge. Death by natural decay occurs because in old age the relation between the integrating and disintegrating processes going on in the organism, gradually falls out of correspondence with the relation between oxygen and food in the environment, and eventually the disintegrating process gets so far in advance, that the organism becomes unfit to act. Death from disease arises either when the organism is congenitally defective in its power to balance the ordinary external actions by the ordinary internal actions, or when there has taken place some unusual external action to which there was no answering internal action. Death from accident implies some neighbouring mechanical changes, whose antecedents are either unobserved from lack of attention, or are so intricate in their dependencies, that their consequences cannot be foreseen. In each of these cases, the relations in the organism fail in their adjustment to the relations in the environment. Manifestly if to every outer co-existence and sequence by which it was ever in any degree affected, the organism presented an answering process or act, the simultaneous changes would be indefinitely numerous and complex, and the successive ones endless—the correspondence would be the greatest conceivable, and the life the highest conceivable, both in degree and length." (p. 383, *op. cit.*)

Now, in the *co-ordination* of actions above indicated lies (to our mind) the *force of resistance* involved in the axiom of Bichat. But whence springs, it may be asked, the antagonism necessitating "the continuous adjustment of internal relations to external relations," an antagonism constantly so powerful that the co-ordination cannot be accomplished; or whence arises it that the power of co-ordinating is so weak that the same result attains?

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* Récherches Physiologiques sur la Vie et la Mort. Par Xavier Bichat.

† The Principles of Psychology. By Herbert Spencer. London, 1855, pp. 353 et seq.

Difficult as the answer to these questions may be, the sufferings and death of our humanity amply testify to the universality and repetition of the occurrences. As we begin to live, we begin to die.

> "Art is long and time is fleeting,
> And our hearts, though stout and brave,
> Still, like muffled drums, are beating
> Funeral marches to the grave."

Be the origin of the antagonism what it may, the result of the unequal contest is either a (variably) rapid destruction of the organism, or a slow but sure breaking up of its vital unity by deperdition and "wear and tear." The direct operation of the several factors in the destroying environments of the organism is more or less definitely marked according to circumstances; of evidence of the power of some, it is the aim of M. Morel to furnish proof in the treatise before us.

> "The existence of a primitive type imagined by the mind as the *chef-d'œuvre* and climax of creation, is a fact so conformable to our belief, that the idea of a degeneration of our nature is inseparable from that of a deviation from this type, which includes within itself the elements of the continuation of the species." (p. 1.)

The deviation is to be seen (according to our author) occurring in a twofold manner—first, in the form of certain *natural modifications* affecting the human race, resulting from the influence of climate, nourishment, and domesticity, and which have as their normal result the final adaptation of the organism to the climate in which it lives. Thus certain typical characters of race are produced, transmissible hereditarily, constituting the varieties of the human species. On the removal of the organism, however, from the particular climatorial, hygienic, and moral environments to others, the tendency is observed of the variety to revert to a more primitive type. The exact force of the external influences here alluded to, the extent of the "natural modifications," and particularly what adaptive effects can arise from the co-ordinating attribute previously pointed out, will be very differently valued, according as the physiologist belongs to one or other of the anthropological schools of the day. One of these asserts that the external environments (climate, nourishment, manners, &c.) can in most cases, in process of time, so alter the *physique*, &c., of man, as to render him capable of living and propagating as an aboriginal, in a locality very materially different to that of which he is originally a native. It admits that in arriving at this permanent "natural modification" of the species, the process may be fatal to many of those undergoing the first acclimatization, or even to numbers of several generations. But nevertheless the result shall be that different races, so to speak, become fundamentally and permanently transmissibly altered—an alteration to continue, however, only so long as the necessitating environments shall exist. This view has even been carried to the ridiculous extent of asserting that the European races located in Northern America would gradually pass into Red Indians!

Mr. Whitehead, admitting that "those several divisions of the human family which have been classified as *races*, are distinguished by fundamental peculiarities of organization which are broadly delineated, and which to a certain degree may be said to be persistent" (p. 5), yet maintains that—

> "It is by no means unreasonable to suppose that races now the most widely dissimilar may owe their distinguishing characteristics to time and circumstances [external environments]; and that as the divergence has been constantly widening, so their approximation may be supposed to have been much nearer in ages gone by. We certainly have no records of antique date of that high contrast between races which is now known to exist between the African and European." (p. 4.)

The same writer, while supporting the general doctrine that organic deficiencies and irregularities—no matter how produced, whether by accident, or existing from birth—are liable to be revived in the offspring, appears to us also not indisposed to go almost hand in hand with Mercatus, (whom he quotes,*) to the effect of having arrived at the conclusion that the quality, character, form, structure, proportion or disproportion, or any preternatural condition, whether of a single member or organ, or existing in several parts, appearing in the offspring, had their origin in the parents, the grand-parents, or the great grand-parents. That such irregularities or defects were similar in their nature, form, and locality to those which had pre-existed in their ancestors; that Nature employs the same instrumentality in transmitting them, whatever the mode of their origination may have been, and that a father begets children similar to himself, and marked with like blemishes.

Another school of anthropology regards these and correlated doctrines with some astonishment. It admits that the physical and psychical characters of man are influenced to a *certain extent* by "the environments," and that the varieties in form ranked under the law of deformation may proceed to a *certain length* by hereditary transmission. But the question is, to *what* extent? Dr. Knox—an extreme exponent of this school, however—shall reply.

> "That by mere climate—giving to the expression its utmost range of meaning—a new race of men can be established in perpetuity, is an assertion which, for the present, is contradicted by every well-ascertained physiological law, and by all authentic history. On the limited habitable territory of the Cape of Good Hope, shut in by deserts and by the sea, lived, when the Saxon Hollander first landed there, two races of men, as distinct from each other as can well be imagined—the Hottentot or Bosjeman, and the Amakoso Caffre. To these was added a third, the Saxon Hollander. . . . . To assert that a race like the Bosjeman, marked by so many peculiarities, is convertible by any process into an Amakoso Caffre or Saxon Hollander is at once to set all physical science at defiance. If by time, I ask what time? . . . So far back as history goes, the species of animals, as we call them, have not changed; the races of men have been absolutely the same. They were distinct then for that period as at

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* De Morbis Hereditariis. 1618.

present. . . . On the banks of the Nile still wander in considerable numbers the descendants of the men who built the pyramids and carved the Memnon and Sphynx. . . . The Coptic blood still lingers in the land, waiting the return of an Amenoph or Sesostris. . . . On the tombs of Egypt, the most valuable of all existing records, there stands the Negro, the Jew and Copt, the Persian, the Sarmatian, nearly as we find them now. . . . If a pure race has appeared to undergo a permanent change when transferred to a climate materially differing from their own, such change will be found on closer inquiry to be delusive. . . . Different races of men are sketched on the walls of the tomb opened by Belzoni, showing that the characteristic distinctions of races were as well marked three thousand years ago as now; the Negro and other races existed then precisely as they are at present." (pp. 26, 36, 70, 99, 180.)*

"The varieties of form classed under the law of deformation . . . are kept in constant check by the laws of specialization restoring man and animals to their specific shapes, else what would life terminate in? Varieties in form proceed only to a certain length; they are constantly checked by two laws maintaining *species as they exist*—1. The tendency to reproduce the specific form instead of the variety; 2. Non-viability or non-reproduction—that is, extinction. This it is which checks deformations of all kinds. . . . For four thousand years have the Chinese been endeavouring to disfigure the feet of their women: have they succeeded in making the deformation permanent? Corsets have been worn time out of mind. Galen complains of them: he ascribes to them all sorts of bad results, deformities of spine and chest. Have such become hereditary? All matrons still produce virgin daughters. For how long have the Jews, with most African and Eastern nations, practised circumcision? Has the deformation become hereditary? . . . Man can create nothing permanent; modify he may for a time, but he can create no new living element. . . . In Britain we have a white breed of cattle confined within the domains of two wealthy families; they remain *white* merely because all calves which show other colours are destroyed. See how difficult the simplest physiological question becomes! . . .

'Naturam expelles furca tamen usque recurret,'

is the pithy and true saying of Horace, verified from all antiquity." (pp. 102, 100, 93, 276.)

This school, without touching the question of the *original* unity of the species, maintains that *now* and *within the limits of the true historic period*, there have existed distinct races of men permanently unalterable by any influence, incapable of permanently amalgamating, and too often abhorring or attempting a war of extermination of each other. It affirms, even, that there are certain diseases peculiar to each; that from what limited observations have been made, there is good ground for believing that these separate races show remarkable organic differences; and that

"Human character, individual and national, is traceable solely to the nature of that race to which the individual or nation belongs. . . . Race is everything —literature, science, art—in a word, civilization, depends on it." (Knox, p. v.)

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* "Besides the well-depicted figures of negroes in Egyptian tombs, the same people are painted upon Etruscan antiquities. Amongst the fine Etruscan vases in the British Museum are some dating from about the third century before Christ, which are in the form of the Negro head, with the woolly locks painted on it; or have the figures of negroes amongst the other people delineated upon them. These latter the artist has marked more distinctly by scattering black knobs over the head to represent the little woolly curls of this race."—The Types of Mankind: Westminster Review for April, 1856.

One of the most important points, connected with the subject, it answers in the following way:

> "Can any race of men live and thrive in any climate? . . . Travel to the Antilles, and see the European struggling with existence, a prey to fever and dysentery, unequal to all labour, wasted and wan, finally perishing, and becoming rapidly extinct as a race, but for the constant influx of fresh European blood. European inhabitants of Jamaica, of Cuba, of Hispaniola, and of the Windward and Leeward Isles, what progress have you made since your first establishment there? Can you say you are established? Cease importing fresh European blood, and watch the results. Labour you cannot; hence the necessity for a black population. Your pale, wan, and sickly offspring would in half a century be non-productive; face to face with the energetic Negro race your colour must alter—first brown, then black; but look at Hayti: with a deepening colour vanishes civilization, the arts of peace, science, literature, abstract justice; . . . the European, then, cannot colonize a tropical country, he cannot identify himself with it; hold it he may with the sword, as we hold India, and as Spain once held Central America; but inhabitants of it, in the strict sense of the term, Europeans cannot become. . . . Withdraw from a tropical country the annual fresh influx of European blood, and in a century its European inhabitants cease to exist." (p. 107.)*

Secondly, the deviation is observed (and it is this with which M. Morel is chiefly engaged) rather as a *morbid deviation from* (*deviation maladive*), than as a modification of, a primitive type; and which deviation is to be regarded as an actual degeneracy. The limits between the two—the modification and the degeneration—or in what light the deviation shall be strictly regarded, are not always easy to be determined. Nor can this be wondered at, seeing that terms and propositions belong rather to science than to nature, and that an exaggeration of the causes of the one change will bring about occurrence of the other. No better illustration of this can be given than by the following extracts, on the one hand from M. Morel, on the other from Dr. Knox:

> "Amongst men of the north who have emigrated to the torrid zone, changes are to be observed worthy of much consideration. According to M. Buchez, who thus writes to me, 'The general circulation is accelerated, the quantity of the blood diminished, and the arteries are less full. The circulation of the vena portæ is increased, as is also the production of the bile; the liver becomes enormous, and it would appear that this organ compensates for the insufficiency of respiration, as in the fœtus. The muscular force is no longer of the same intensity.' Now, this accomplished physician inquires of me if this special modification, impressed on the organism by climatorial influences, is to be regarded as a degeneration? Evidently not: and M. Buchez perceives in it, like myself, but a profound modification hereditarily transmissible. This modification will arrest itself within determinate limits, and finish with the result of adapting the constitution of the individual to the climate in which he is necessitated to live." (Morel, p. 31.)

But there is another view of this question:

> "Of the tropical regions of the New World I need not speak; every one knows that none but those whom nature placed there can live there—that no Europeans can colonize a tropical country. But may there not be some doubts

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* For some details connected with the "Comparative Pathology of the different Races of Men," reference may be made to this Journal, vol. iv. p. 551, Oct. 1849.

of their self-support in milder regions? Take the Northern States themselves. There the Saxon and the Celt seem to thrive beyond all that is recorded in history; but are we quite sure that this success is fated to be permanent? Annually from Europe is poured a hundred thousand men and women of the best blood of the Scandinavian, and twice that number of the pure Celt, and so long as this continues he is sure to thrive. But check it . . . already the United-States man differs in appearance from the European: the ladies early lose their teeth; in both sexes the adipose cellular cushion interposed between the skin and the aponeuroses and muscles disappears, or at least loses its adipose portion; the muscles become stringy and show themselves; the tendons appear on the surface; symptoms of premature decay manifest themselves. Now, what do these signs, added to the uncertainty of infant life in the Southern States, and the smallness of the families in the Northern, indicate? Not the conversion of the Anglo-Saxon into the Red Indian, but warnings that the climate has not been made for him nor he for the climate." (Knox, p. 73.)

The reviewer of the work of Mr. Ranald Martin[*] in the 'North American Medico-Chirurgical Review,'[†] has forcibly drawn attention to the fact, that every page of Mr. Martin's work unceasingly establishes the degrading influence of the Indian climate upon the European race. The idea must be given up that the mortality of those regions is chiefly due to sweeping epidemics, and their unhealthiness to causes against which some years' residence gives comparative security, rather than to the slow unceasing influence of a power which no acclimation overcomes, and which seems in a league of unending hostility with the native against the foreigner who has invaded his shores. Mr. Martin himself quotes Twining, who states that, after careful inquiry, he *was not anywhere able to find a sample of the third generation from unmixed European stock;* and then adds:

> "I believe that such is scarcely to be found in any part of India, and least of all in Bengal Proper. So much for the question of European colonization, respecting which much has been said and written, regardless of the fact that Nature has set her ban—a blighting interdiction—upon it."

We confess we deem it a forlorn hope to imagine that many of the important topics included under anthropology shall be investigated in an entirely unprejudiced and dispassionate manner. They are in some relations so closely connected with certain conventional theories of the day (often described under the terms *humanitarianism* and *progress*), that even with—as we now write—the war of races in India and China, the periodic shooting of the Kaffirs at the Cape, the extermination of the American, Australian, and New Zealand Aborigines, the state of Cuba, of South America, and of the islands in the Gulf of Mexico, of the slavery of the New World—to say nothing of Spain, Italy, and other countries nearer home—all before our eyes, it is doubtful whether a writer, regarding truth above all things, and striving to exhibit it with dispassionate fairness, would not run a risk so hazardous that few would accept it. The "progress of the age" is the war-cry of a vast party, booming above the voice of the world's ever-rolling waves. But in what that so decided progress consists, we are not always definitely informed. The wholesale poisonings, murderings, bank and other swindling, of the day; the prostitution, slavery, Indian torture, Neapolitan dungeons, and visions of La Salette; the wholesale fighting of the last five years must be heard, as well the claims of steam, photography, and the electric telegraph.*

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[*] The Influence of Tropical Climates on European Constitutions, &c.

[†] July, 1857, p. 483.

> "We hear kindhearted men speak of the progress of mankind! What progress do they mean? . . . . Look at Europe, at either bank of the Danube, at Northern Africa, at Egypt, at the shores of the Mediterranean generally, and say what progress civilization has made in these countries since the decline of the Roman Empire. Is Ireland civilized? In Cicero's time, the Island of Rhodes presented a civilization which no part of Britain can pretend to. What is its state at this moment? . . . . One thing I admit, and that only—that the later races which threaten to (and which I think must) become the dominant ones, show energies and combination for a purpose, mechanical applications and diffusive efforts, which no race before them ever showed; in every other quality they are evidently inferior."† (Knox.)

Progress of humanity, indeed! Is it in philosophy? Behold Plato, Aristotle, Socrates and Seneca! In eloquence and pleading? Listen to Cicero and Demosthenes! In poetry? There are Æschylus, Homer,

"And around them fair Bacchantes,
Bearing cymbals, flutes, and thyrses,
Wild from Naxian groves and Zante's
Vineyards, sing delirious verses!"

In science? Euclid! In history? Tacitus and Xenophon! And these but units in that august dynasty of historic names where shine Augustus and Zenobia, Antoninus Pius and Palmyra, Titus and Aurelian, Corinth and Pharsalia, Carthage and Constantine! Progress of humanity, indeed! Ere the last olympiad was attained, the world had witnessed the hypostasis of the "beautiful," and received that glorious dower which has for ever left us in despair. Recall the Parthenon, the Choragic Monument of Lysicrates, the Ionic ruins by the Ilissian stream. "Kingly as Agamemnon, graceful as Apollo, the long flutings of their columns simple as the folds of an Athenian maiden's robe." Yet these but the dwellings of still more ineffable forms! There they stand, in all their marble yet radiant beauty, those children of the Penthelic quarries, pure, immortal, and divine—the Apollo and Niobe, the Antinous and Clytie, the Laocoon and Bacchus, the Panthenic frieze—forms whose beauty no mutilation can despoil, dazzling us with a purity we cannot imitate and with a perfection we can scarcely comprehend. The vase which held the ashes of a Greek girl is now a befitting present to a king!

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* "It is a remarkable fact, that, exclusive of the metropolitan cities in England and France, nearly the same proportion, 34 in every 100, of the men who marry do not write their names in signing the marriage register . . . . The French women are even less versed in writing than English women; for of French women 55 in 100 did not write their names; of English women 48 did not write their names, but made their mark. Both the proportions are deplorably high, and show much has to be done to convey the first rudiments of instruction to the great body of the people in two of the most enlightened nations of the world. . . . . 40,783 children were born out of wedlock in 1855, giving the proportion of 6·4 such children to every 100 children born alive, nearly 1 to 15."—Eighteenth Annual Report of the Registrar-General. London, 1857.

† Op. cit., pp. 3, 90.

M. Morel's chief test as to the nature of a particular deviation—i. e., whether it is rather a *modification* or a *degeneration*, and what he would wish us to understand by his use of this latter term—will be gleaned from the following:—

> "A reversion of a variety to its original type has been wrongly termed (in my opinion) a degeneration, by Heusinger. This tendency of the organism to revert to its normal form at least indicates that the modification artificially impressed upon it is far more factitious than real. On the other hand, in the state designated by me degeneration, this propensity to reversion is not seen, and this because the degeneration is a morbidly constituted state, and the degenerated being, if abandoned to itself, falls into a progressive degradation. It becomes not only incapable of transmitting (as part of a chain) the progress of humanity, but it is even one of the chief obstacles to the procession of this latter from its contact with the healthy part of the population." (p. 6.)
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> "The more profound the degeneration, the less possible is the unity and propagation of the great and single family of the human race. The continuation of a morbid variety—as in the case of crètins, for example—can only happen at the expense of the healthy members of a population who form alliances with persons more or less deeply infected, and who, quite independent of sexual union, contract the elements of their ulterior degeneracies in the medium of intoxication, where the evil has its primitive and essential cause." (p. 15.)
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> "Degeneration may be either congenital or acquired, complete or incomplete, susceptible of being favourably modified, or be entirely incurable. . . . The extreme term of it exists when the individual belonging to any particular class of degenerated beings is not only incapable of propagating the great and single family of the human race *under normal conditions*, but proves himself completely impotent, either from non-development of the genitals or from an absence of all prolific faculty." (p. 72.)
>
> "The sterility of the parents and the premature death of the children are in general the two precursory symptoms of the degeneracy of a people and of their imminent decadence." (p. 386.)

The existence of such a state or degeneration being admitted, and moreover (as we shall presently see), in the opinion of the author, being upon the increase both as regards intensity and extent, M. Morel undertakes to inquire into those general causes which in their fatality "modify in a most anxious manner the health of the present generation, and threaten the well-being of the future."

> "The necessarily connective unity (*solidarité*) of the causes of degeneration I no longer doubt, and this treatise is intended to demonstrate *the origin and the formation of morbid varieties in the human race.*" (p. ix.)

M. Morel rejects any formal consideration of the question, whether humanity, *as a whole*, is in a state of progressive degeneration; he thinks it is in all likelihood insoluble, or rather that the proposition must be put into other terms.* The author rather engages himself in illustrating the doctrines that numerous degenerations invade the species, and that these degenerations are in a ratio to the prevalence of certain morbific or antihygienic factors—their causes. But we think, in spite of our author's assertion at page 360, that the general tenor of his remarks go to show a belief in the increasing degeneracy of the human race—e. g.,

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* In relation to some points connected with this question, we may refer to 'The Natural History of the Human Species, its Typical Forms,' &c., by Lieut.-Col. Charles Hamilton Smith. Edinburgh, 1848, pp. 155–168; and also to 'Lectures on Physiology, Zoology, and the Natural History of Man.' By W. Lawrence, F.R.S. Third edition. London, 1823, pp. 369 et seq.

"The constant increase in Europe, not only of mental alienation, but of all those abnormal states which have special relations with the existence of physical and of moral evil in the world, was likewise such a circumstance as could not fail of arresting my attention. On all sides I heard our profession complaining both of the increasing number of the insane, and of the more frequent complications (general paralysis, epilepsy, and a more marked depression of all the intellectual and physical forces) which contributed to diminish the probabilities of cure. Add also that neuroses—such as hysteria and hypochondriasis—often attended by tendency to suicide, now attack (and in alarming proportion) both the working and agricultural classes, whilst before they seemed almost the exclusive appanage of the rich and *blasée*. In fine, imbecility, congenital or acquired, idiocy, and other more or less complete arrests of development of the body and of the intellectual faculties, indicated the existence (in frightfully increased amount) of individuals who received the principle of their degeneracy during their intra-uterine life.

"The continued increase of suicide, of crimes against order and law, or else against the person; the monstrous precocity of young criminals, and the degeneracy of the race, which in many localities can no longer fulfil the conditions required for military service, are irrefragable facts. They prove in unmistakeable terms that the anxiety of European Governments has not been excited without cause." (p. 7.)

"The etiolation of the race, the development of paralytic and convulsive affections, bad conformations of the head, general diminution of the intellectual powers, the manifestation of the very worst tendencies, immorality, and the increase of the inmates of asylums and prisons, were the deplorable circumstances I everywhere met with, and always with a constant uniformity." (p. 352.)

The view taken by our author of the propriety of regarding the insane and fatuous inhabitants of our asylums, &c., as marked evidence of this wide-spreading degeneracy, and as also proof of the relative increase of the evil, appears to be maintained by others than by M. Morel. A recent and known writer thus remarks:[*]

"It is a question entitled to the serious consideration of the practical physician and medical pathologist, whether there has not been of late years a marked increase in the number of cases of disease of the brain and of the nervous system? We think the fact is indisputable. Physicians who have favourable opportunities of investigating this subject, not only agree in opinion that such diseases are of more frequent occurrence, but that a certain unfavourable (but in its incipient stage certainly not incurable) type of cerebral disorganization develops itself in the present age at a much earlier period than formerly. Softening of the brain, for example, now often manifests itself at the early age of thirty and thirty-five. . . . . Although the average duration of life *appears* to be greater than formerly, there can be no doubt that the power of vital resistance has sensibly diminished, and that not only the brain, but other important organs, more readily yield to the influence of disease."

Again, to quote another writer,[†] who, after speaking of the increase of insanity being perhaps only *apparent*, observes:

"But, on the other hand, if it be true, as we have reason to fear, that insanity, so far from being diminished, is actually on the increase . . . . it seems, indeed, as if the world was moving at an advanced rate of speed, proportionate to its approaching end. What, in short, must we expect if a progressive deterioration of mental and bodily powers be symptomatic of the age, of succeeding ages, perhaps of all time? But let us trust this is not the case, though it is apparent that some physical alteration has crept over the *vis vitæ* of our own generation within the present century—a change, it may be sufficient to say, attacking the stamina of life."

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[*] On Neglected Brain Disease and Suicide. By Dr. Forbes Winslow.

[†] On the Increase of Insanity, by John Hawkes: Psychological Journal, July, 1857.

By referring to the July number (page 260) of this Journal, it will be seen how similar and gloomy a view is taken by Dr. Pollitzer (a late German writer) of the present condition of the human race. He affirms the European deterioration to be profound, and a sad memorial of civilization indeed. But other observers are by no means inclined to agree in these disconsolate teachings—e.g.,

> "It has been asserted by some psychologists that lunacy is on the increase, and that its rapid development of late years has been consequent upon the increased activity of the national mind. This statement is certainly startling, and calculated to arrest the attention of all thoughtful men. Is it true that civilization has called to life a monster such as that which appalled Frankenstein? Is it a necessity of progress that it shall ever be accompanied by that fearful black rider which, like Despair, sits behind it? . . . A patient examination, however, of the question entirely negatives such a conclusion. . . Still, the fact remains, that within a period of eight years an increase of sixty-four per cent. took place in our pauper lunatic asylums. These figures, however, afford no more proof of the increase of pauper lunatics than the increase of criminal convictions since the introduction of a milder code of laws and the appointment of the new police, afford a proof of increased crime. Medical practitioners have of late years taken a far more comprehensive as well as scientific view of insanity than formerly, and many forms of the disease now fall under their care that were previously overlooked, when no man was considered mad unless he raved or was an idiot. But the great cause of the increase of lunatics in our asylums is to be ascribed to the erection of the asylums themselves. These establishments . . . have drained the land of a lunatic population which before was scattered among villages or workhouses."*

We have a reply, however, to these observations from the pen of Dr. Tuke:

> "In opposition to the view, that civilization would seem in many respects to favour the development of insanity, it has been asserted by many writers (and among others by the author of the spirited article on Lunatic Asylums in the 'Quarterly Review') that there is a larger number of pauper lunatics in the agricultural than in the manufacturing counties. Were this, however, admitted to be the case, the inference which has been drawn by no means necessarily follows. In the agricultural districts (which are by these writers taken as the representative of savage life) there are to be found, as well as in the manufacturing districts, many of those very elements of modern civilization which are not found to the same extent in savage life; such, for instance, as the excessive use of alcoholic liquors, and the hard struggle to obtain an honest livelihood. Drink and want, and consequent domestic suffering, produce their certain effects in the generation of insanity in agricultural as well as in manufacturing districts. It should, besides, first be shown by those who make this comparison for this purpose, that there are not in other respects any essentially dissimilar conditions in the two districts. Indeed, Sir Andrew Halliday, in whom this statement originated, himself attributed the fact in part to the circumstance of the women in agricultural districts labouring in the field during pregnancy; and Mr. Prichard suggests that the hard labour and low diet to

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* Quarterly Review, April, 1857; art., Lunatic Asylums, pp. 390 et seq.

which the males are subjected, may have an influence on the offspring propagated by them. But we do not think this line of argument need be farther pursued. The *fact*, we believe, may be boldly denied. The statement is not established that more persons become insane in agricultural districts, proportionately, than in manufacturing ones."*

Her Majesty's Commissioners, lately inquiring into the state of lunacy in Scotland, remark, in their official Report upon "an idea very generally prevalent, that the number of the insane, in proportion to the rest of the community, is decidedly on the increase," that—

> "The question cannot be decided by an appeal to statistical returns. . . . Our inquiries afford no means of deciding whether or not the number of insane is actually on the increase. They afford us grounds for thinking that civilization, which leads to an improved condition of the people, is not productive of insanity."

Notwithstanding the difficulties surrounding this important question, we confess we are afraid that Dr. Tuke's conclusions come very near the truth. The essence of these is, that (after making due allowance for error) insanity attains its maximum among civilized nations; that, having in regard the main causes of it, they outweigh in modern civilized society those circumstances which might be supposed to favour mental health; and that, even under an infinitely more perfect civilization than at present exists, there would still be found greater danger to the integrity of the centre of the nervous system than under a state of barbarism.

We return to M. Morel, whom we shall take up at his inquiry into the elements of what he terms "a natural classification" of the causes of degeneracy. These causes may be conveniently arranged as follows:

1. Degeneracy from *toxæmia*,—as from the use of alcoholic fluids, opium, hachisch, tobacco, &c.; from the effects of such mineral agents as lead, mercury, arsenic, phosphorus, &c.; and from the employment of poisonous vegetable material: like diseased rye, maize, &c.

2. Degeneracy from the influence of *malaria*, from peculiarities of geologic formation, soil, &c., as the effect of certain plagues and pestilences now and then afflicting humanity, profoundly influencing the system, and

> "Which so often engender those morbid temperaments whose types are to be found in the generations succeeding those who have been so cruelly tested. . . . The idea of a special intoxication cannot in the present day be dissociated from our view of such epidemic influences." (p. 48.)

3. Degeneracy from the effects of the "great town system," whose chief elements are unhealthy situation, noxious local and general atmosphere, insufficient and improper nourishment, deleterious avocations, moral and social misery, wretchedness, and crime.

4. Degeneracy from fundamental morbid states, either congenital or acquired, as witnessed in imperfect cerebral development, deaf mutism, blindness, the syphilitic, scrofulous, &c., diatheses.

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* On Civilization as a Cause of Mental Disease, by Dr. Tuke: The Asylum Journal of Mental Science, for October, 1857, p. 98.

5. Degeneracy from *mixed causes*, and some special ones not included in the above. According to our author, a careful study of the effects of the just-mentioned deleterious influences leads to the establishment of the following laws—viz., that

> "The most active causes of degeneracy of the human race are those which, directly and repeatedly influencing the brain, give rise to special conditions, periodically placing those who are addicted to the use of an intoxicating agent under the conditions of temporary insanity.
>
> "The hereditary transmission of a degeneration takes place the more surely as, on the one hand, the nervous system is endowed with a tendency to convert the aptitude of reproducing the periodical morbid phenomena into a new faculty of the brain, and as on the other the morbid transformations in the individual succeed in such way that they seem to run through a fatal circle, whose different peripheral degrees are marked by an order of phenomena of a fixed and determinate kind." (p. 334.)

We shall now proceed to notice some of the above alleged causes of "degeneration" in detail. The first we shall touch upon is *alcoholism*, which, important as it is, forms a subject far too extensive to allow us to enter into anything like an analysis of the effects of alcoholic poisoning on the frame, whether such poisoning be of an acute or chronic character. Not only this, but we should be led into very lengthy argumentation, seeing that individually our opinion on some fundamental points would be opposed to those held by the majority of writers. Farther, several important points in the history of alcoholism have been already discussed in this Journal.* To the statements that one of the most wide-spread habits is the habitual use of alcoholic fluids; that such appears to constitute one of the most common causes of both physical and psychical disorder; that much of the anxiety and crime men suffer is due to this lamentable propensity; and that what is so detrimental to the individual must become so to the race,—few, we suspect, will be found to demur. That man must be blind indeed, and morally perverted, who could pass a single day and night in a "great metropolis," and not feel himself a well-satisfied witness of this, humanity's great and most disgraceful shame! There is scarcely, too, a more sad and depressing aspect under which the subject of a Christian State can contemplate its government, than that which represents it as not only tolerating, but absolutely fostering, the growth of houses for the sale of fermented fluids. Not sad and depressing alone because of the evil and misery which result, but humiliating because of the enormity of the hypocrisy, the intensity of the "sham," which, on the one hand, providing laws and magistrates to meet and minister to the crime which drunkenness produces, on the other hand draws its revenues from its very source, and does so much in a way to increase such revenue, that it becomes not toleration only, but cordial support. And this, too, in a Christian country, which is always striving at the evangelism of neighbouring States, yet truthfully permitting the remark—

"It is a fact which, to the shame of civilized Europe, it is impossible to conceal—viz., that the domination of the conquering race over the aborigines of the New World is more mercilessly established by the spread of brandy than by the force of arms."* (p. 388.)

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* Vol. vii. pp. 46 et seq.

Passing entirely over the question as to how far the use of fermented fluids, within a certain amount and frequency of repetition, is or is not to be advocated, there can be but one reply to that which affirms that in most civilized communities such an amount and such a frequency of repetition are by vast numbers indulged in as to constitute a powerful source of human suffering and misery, and degeneracy of the race. The records of hospitals, police courts, debtors' prisons, and workhouses, might be appealed to, if proof need to be produced.

> "Alcohol produces a state of disorder exhibiting all the symptoms of a true *empoisonnement*. No doubt other agents exist, which likewise so affect the nervous system and intellect as to give rise to special forms of disturbance, and even sometimes to render difficult the differential diagnosis, but nevertheless there is always something peculiar about the action of alcohol." (p 93.)

The effects of chronic alcoholism in giving rise progressively to "degeneration" of the individual, are seen mainly in the inducement of the following states: loss of appetite, indigestion, nausea, vomiting and occasional diarrhœa; frequent emaciation and cachexia, accompanied by pustular eruptions, eructations, and offensive breath; serious disturbance of the functions of, and the production of organic lesions of, the liver, kidneys, and heart, and the coats of the vessels, followed by fatal serous effusion or dropsy, hæmorrhages, extravasations, or apoplexies. Intercurrent with these states, at variable periods, and otherwise contingently, "fits of drunkenness," with sexual incompetency, and different forms of psychical aberration ensue, or "delirium tremens," "*mania à potu*," suicidal melancholy, &c. &c., occur. Finally, epileptiform convulsions, general paralysis, or drivelling idiocy may close the scene. That state of most extreme degradation of the living body which can be witnessed,—viz., general paralysis—is markedly a result of continued addiction to the use of large quantities of spirituous liquors. We are told in Gamble's 'Views of Society in the North of Ireland,' that London wigmakers can distinguish the hair of a man who has been a drunkard, and that it bears consequently a less price!

> "We have made—as it will have been seen—two distinct classes of persons degenerated in consequence of alcoholic excesses. One class arrives at length, by a series of well-marked nervous lesions, physical and intellectual, at general paralysis. The other, although profoundly affected as regards its innervation, remains stationary at a point, leading a miserable existence, characterized physically by a special condition of cachexia and marasmus, morally by a manifestation of the worst tendencies and of the lowest brutishness." (p. 113).

It is easy to conceive how such serious effects, arising in the individual from the abuse of alcohol, should influence the procreative faculty, first, diminishing the vital standard of the offspring; and secondly, annihilating the generative power altogether. These results, coupled with the social and moral aberrations ensuing from the bad

* It is Chateaubriand, we believe, who somewhere remarks, that in founding a colony the Spaniard builds first a church, the Frenchman a theatre, and the Briton a public house.

example, misery, and want, introduced into the bosoms of families by those addicted to the crime of drunkenness, are ample causes of the degradation of masses of the human race. Further, the vice itself is actually hereditarily transmissible; and, says M. Morel—

> "I have never witnessed the cure of such patients whose tendency to alcoholic excesses took their '*point de depart*' from the hereditary predispositions bestowed upon them by their parents." (p. 118.)

The author gives (p. 124) a very well-marked illustration of the succession of morbid phenomena in different descendants of the family of a great-grandfather, a dipsomaniac, until they led to the extinction of the race. We see entailed in the

1st generation—Immorality, depravity, alcoholic excesses, brutish disposition.

2nd. Hereditary drunkenness, attacks of mania, general paralysis.

3rd. Sobriety, hypochondriasis, lypomania, systematic ideas of persecutions, homicidal tendencies.

4th. Intelligence but slightly developed, access of mania at sixteen years of age, stupidity running on to idiocy, and to a condition involving extinction of the race.

Dr. Whitehead places intemperate habits as first amongst the causes of insanity in this country, and observes, in respect to them—

> "Cox remarks that nothing is more common than to see the offspring of an intemperate parent become demented. Dr. Adams also expresses a similar opinion. 'I shall therefore,' says the author, 'offer only one remark on this subject—viz., that women who are habitual drunkards generally produce immature or idiot children. But,' he adds, 'this is by no means a proof that the failings of the mother have been in every instance the cause.'" (p. 42.)
>
> "Scrofulous affections, or a tendency thereto, may be acquired in various ways, of which one of the most common is intemperance." (p. 31.)

For much detail and argument bearing upon the points we have thus cursorily touched, we must refer the reader to M. Morel's work. We shall now leave the circle of the *individual* and his family, and look to the effects arising "*au sein des grandes agglomérations constituant les peuples et les races*" (p. 365). Following this branch of the subject, the author appeals to the effects produced upon the population of Sweden in particular, as detailed in the investigations of Dr. Magnus Huss.[*] According to a moderate calculation, from forty to fifty millions of "cans" of brandy[†] are annually manufactured in Sweden; and Sweden contains about three millions of inhabitants, from whom, if the children, women, and those whose position, &c., necessitate either abstinence or moderation, are subtracted, 1,500,000 persons each consume annually from 80 to 100 litres (140 to 170 pints). Formerly (in 1780) only about one-tenth part of this quantity was consumed by a population comparatively little less in numbers. Of course these proportions are only approximative.

"In certain districts of Sweden, as in some provinces of the United States,

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[*] On the Endemic Diseases of Sweden: see vol. x. of this Review, p. 365.

[†] Nearly two hundred millions of litres; each *kanne* may be taken *roughly* at five imperial pints—*strictly*, at 189·9413 cubic inches.

> of England, and of France (as I have myself observed in the Vosges), the women do not abstain from brandy, and there occur particular days of the year when drunkenness is the sad spectacle that husband and wife equally present to their children." (p. 369.)
>
> "M. Magnus Huss informs us, too, of the fact that poor and ignorant mothers often know no better method of appeasing their crying infants than giving them a pledget of linen soaked in spirit to suck." (p. 374.)

Now what the deplorable results of such habits are is well seen—e.g., at Erkistuna, in Sweden, where the vice of spirit-drinking is very marked. Here the mortality is at the rate of 3 per cent., or one in thirty-three; whilst in Jamtland, a province noted for the sobriety of the people, it is only one in eighty. Insanity, suicide, and crime are all, according to Huss, on the increase in Sweden. In fact, to use this writer's expression—

> "Things have arrived at such a pass, that if energetic measures are not had recourse to, the Swedish nation is threatened with incalculable evils; . . . . it is an indisputable fact, that already, in respect to physical power and stature, the people have degenerated from their ancestors."

Leaving Sweden, M. Morel refers to the United States as another country in which infinite danger threatens the population from the wide-spread vice we are discussing. He states, that before the practice had attained the extent it now has, from 40,000 to 50,000 persons were killed annually from "strong liquors." Great Britain unhappily furnishes also a very prominent instance of a country whose inhabitants consume large quantities of fermented fluids. In great towns in England, gin and other spirits are used enormously, i. e., at the rate of two and one-third gallons to each adult male; whilst in country districts, beer of greater or less strength or "headiness" is chiefly employed. In Ireland and in Scotland whisky is consumed everywhere, and this at the terrific rate of three and a half gallons in Ireland, and of eleven one-sixth gallons in Scotland, to each adult male. It was remarked in a former article in this Journal, that the minister of a Highland parish informed the author that he could point to some six or eight individuals who, though seldom or never seen to be drunk, severally consumed from half a gallon to a gallon of spirits weekly, or from twenty-six to fifty-two gallons each in the course of the year. In some districts of France, as in Alsace, for instance, addiction to spirit-drinking is extreme. M. Danis states that both sexes and all ages are equally addicted to this custom; and when on Sunday the people of the Vosges districts are congregated in church, the place is literally poisoned by the odour of potato brandy! "Can we be astonished," says M. Danis, "that the issue of such parents come into the world imbecile and idiotic?" In Prussia, according to Dr. MacCulloch, the consumption of spirits is equal to between forty and forty-five millions of our imperial gallons in the year. M. Morel alludes to the great tendency of "half castes," or mixed races, amongst the South American people, to the use of intoxicating fluids. He finally sums up in the following manner:—

> "We have no need of further proof to demonstrate the fact that the use of

toxic inebriating substances gives rise to in the race the same pernicious effects as result to the individual. They have invariably the same character in all latitudes. . . . . New maladies are generated and old ones take on increased fatality; the mean duration of life is lessened; the viability of new-born children gradually less and less to be depended upon; and disturbances of the moral and intellectual nature become at length signalized by the highest rates of insanity, of suicide, and crime." (p. 389.)

The abuse of *opium* we shall next refer to as causative of the degeneration of the race. This is chiefly dealt with by M. Morel in respect to "opium-smoking" by the Chinese, but the practice of "opium-eating" plays not an unimportant and deleterious part amongst other nations. Upon the effects of opium-smoking, and the extent of its practice in China, two opposite views are held. One party maintain that the former are highly deleterious, and the latter very considerable; whilst the other view the effects as less injurious, and the practice by no means so universal as is imagined. M. Morel (following the well-known writer, M. Huc) thus commences his "considerations" upon these points:—

"Humanity, at no period of its history perhaps, has presented such a fact as we are witnesses of to-day—three hundred millions of persons, united beneath the absolute authority of the same government, speaking the same language, and ruled, in appearance at least, by the same religious ideas, offer to us the sad spectacle of a nation menaced in its dearest interests by the most degrading and most fatal habit it is possible to conceive. The account we have given of the intoxication from alcohol leaves perhaps far behind it that which is told us of the disastrous effects exercised by opium." (p. 155.)

Further on, M. Morel writes:—

"Looking at the effects produced by this poison upon the individual, it is easy to generalize from them; and if we consider the actual condition of China, one is affrighted at the intellectual, physical, and moral future reserved for that unhappy land. . . . . . The same fatal prognostic may be extended to the inhabitants of Java, of Sumatra, and of the other Isles of Sunda; and nothing equals, we know, the unbridled passion of the Malays for this redoubtable poison."

On the other hand, Dr. Eatwell[*] observes:

"Having passed three years in China, I may be allowed to state the results of my observation; and I can affirm thus far that the effects of the abuse of the drug do not come very frequently under observation, and that where cases do occur the habit is very frequently found to have been induced by the presence of some painful chronic disease, to escape from the sufferings of which the patient has fled to this resource. . . . . As regards the effects of the habitual use of the drug on the *mass* of the people, I must affirm that no injurious results are visible. . . . . Proofs are still wanting to show that the moderate use of opium produces more pernicious effects upon the constitution than the immoderate use of spirituous liquors; whilst, at the same time, it is certain that the consequences of the abuse of the former are less appalling in their effect upon the victim, and less disastrous to society at large, than the consequences of the abuse of the latter."[†]

M. Morel himself also refuses to go the length of those who have so far generalized as "to leave nothing in perspective but the total extinction of the race" (p. 401), as he thinks that "the ravages caused by opium are concentrated in certain classes of Oriental society" (p. 402). Bad as they are amongst these, the author believes that the effects would be still more injurious if the practice of opium-smoking was common to European nations, for—

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[*] Pereira's Materia Medica, fourth edition, 1857. Vol. iii. p. 625.

[†] Op. cit.

> "It is reasonable to suppose that the predominance of the lymphatic temperament, the inferior development of general sensibility, the greater indolence and apathy of the Orientals generally, but particularly of the Chinese, and, in fine, the absence for the most part of such motives as over-excite the cerebral functions of Europeans, produce a notable difference in the action of any given poison on the human economy." (p. 407.)

It has been stated that there exists in Paris a society, the members of which are styled "Opiophiles," who meet together to smoke opium and to record their sensations in a register belonging to the society's archives. The truth of this statement M. Morel has been unable to authenticate, and trusts "that, if it be true, it is confined to a few eccentric individuals, and that so deplorable a custom will not be introduced into France" (p. 170).

In England the practice of "opium-eating" is said by some to have greatly increased, and that of "opium-smoking" to have already invaded the "Great Metropolis." We have met with the assertion that the abuse of opium has increased amongst the members of "teetotal" societies, particularly also in those localities where ague is of frequent occurrence, and where spirits used to be freely employed. In the last edition (1857) of 'Pereira's Materia Medica' there is a note by the editors to the effect that—

> "There is great reason to believe that the practice of opium-eating is very common in this country among the lower as well as the middle classes. The consumption of opium is very great, and wholly disproportioned to the quantity required for medicinal purposes. From an official report published in July, 1853, it appears that in the five months preceding that date, the enormous quantity of 63,354 lbs. of opium had been imported into this country; the quantity for one month was 9699 lbs."

The employment of *hashish* and other preparations of *Cannabis indica*, by the Orientals, is discussed by M. Morel, who is opposed to the doctrine supported by some, that their use in moderate amount and under special circumstances may be considered inoffensive. With respect to *tobacco*, the author thus expresses himself:—

> "What may be the part which tobacco plays in causing degeneration of the race? And in admitting even that the degenerative action of this narcotic agent is a well-demonstrated fact, how far would it be good medical hygiene to attack the employment of it, since it has become to all nations not alone the object of a caprice, of a more or less imperious custom, but of a veritable necessity that many must satisfy at any price?" (p. 171.)
>
> "Is the employment of tobacco detrimental to the health? It may be replied, that to solve so simple a question it is but necessary to appeal to experiment and observation. But it would seem that in both cases these valuable methods of inquiry have not as yet satisfactorily afforded us that which we have a right to expect. If we address ourselves to experiment, not the least doubt can be held as to the deleterious power of the active principle of tobacco." (p. 175.)
>
> "If we would infer *à priori* the action of nicotine, we must be terrified at

the dreadful consequences that so powerful a poison must produce. But here, as we have already stated, observation is at fault, and we must conclude, knowing the enormous quantity of tobacco consumed in Europe, that the dose of *nicotine* absorbed by each smoker is reduced to such a *minimum* amount, that the accidents resulting constitute but very rare exceptions." (p. 178.)

M. Morel, after examining the influence of tobacco upon the workmen employed in manufactories of snuff, &c., thus concludes his observations :—

> "The *exposé* we have given of the effects of tobacco upon the health removes us equally from the extreme opinions prevalent, and if observation does not allow us to attribute to this narcotic plant the same toxic effects as those produced by alcohol, opium, and other agents to be presently alluded to, we are nevertheless far from rejecting all that has been advanced as to the deleterious consequences of the *abuse* of tobacco." (p. 184.)

Want of space compels us to pass over all details connected with the degenerative influences of the actions of mineral agents like lead, mercury, arsenic, phosphorus, &c., and of vegetable substances, as ergot of rye, &c., and to content ourselves with the following *résumé* of the author :—

> "The reader who has followed with attention the exposition we have entered into, will have been struck with the analogies presented by the chief toxic agents in their ultimate actions upon the nervous functions. If we except, in fact, those energetic poisons whose action is instantaneous, all the rest appear to assimilate with the organism under such conditions as allow us to follow step by step the ravages they exert upon the economy. Formications of the extremities, anæsthesia, partial paralysis, and evanescent delirium, invariably precede those convulsive attacks, which are the forerunners of the general paralysis and the complete loss of the intellectual faculties. In a word, the regular progression to be remarked in the organic lesions allows of our determining the phases which must invariably succeed before that extreme length is attained —viz., *the degeneration of the individual.*" (p. 271.)

We pass next to the causes of degeneration comprehended under our *second* category. M. Morel rightly observes that the perniciousness of the "marsh poison," and its greater or less degree of noxiousness according to season, climate, modifications of the soil, and hygienic conditions of the people exposed to its action, are facts universally admitted. He, however, declines to dwell upon all such details, as his aim is simply to point out the intimate connexion which exists between certain degenerations of the human race, and the medium in which the inhabitants of marshy countries "live, move, and have their being." The more chronic influences exerted by *malaria* are best seen and best known as exhibited by the people of Forez, La Brenne, Sologne, Berry, Dombèe, of the Pontine Marshes, and of La Bresse. The author selects, in preference, the history given by Montfalcon, as affording a well-marked general description of the physical, intellectual, and social degradations due to this virulent and poisonous power. An inhabitant of La Bresse—

> "Suffers from birth, and exhibits from the first days of existence a deep impression of the unhealthiness of the climate. Scarcely has he quitted the bosom of his nurse, than he languishes and gets thin; a yellow tint tinges his skin and eyes, the viscera become engorged, and he probably dies before he has attained his seventh year; or if he attains this age, he does not live, but vegetates; he continues cachectic, œdematous, subject to putrid and malignant

fevers, to endless autumnal remittents, to passive hæmorrhages, to ulcers of the extremities, which heal with great difficulty, and the miserable being is scarcely able to fight against the diseases which convert his life into a prolonged dying. The inhabitant of the Bresse having, perhaps, arrived at his twentieth or thirtieth year, disorganization commences, his faculties become enfeebled, and generally the age of fifty years is the conclusion of his days. '*We do not live,*' said one of the miserable inhabitants of the Pontine Marshes, to a stranger, astonished that existence could go on in so unhealthy a region, '*We do not live—we die!*'" (p. 618.)

Though generations thus rapidly pass away, the population, according to Foderè, maintains a scarcely to be expected equilibrium, but which is explained by all marrying at an early age, and repeatedly too. Foderè alludes to three brothers who had married amongst them no less than fifteen women, and one of the former was again a widower! A more or less intense state of cachexia, stunted growth, engorgement of the chief viscera, especially of the spleen, languor and inertia of all the functions, aggravation of ordinary diseases, the superaddition to them of lesions, only explicable by the atony and diminished power of reaction of the nervous centres, and finally, a diminished longevity, are physically the characteristics of degeneracy shown by paludian races. On the other side—

> "The torpor of intelligence, the apathy, a kind of hebetude, passing on under some circumstances to a state of idiocy, and under all to the most extreme indifference, reveal the influence of the degenerating principle in the sphere of the intellectual and emotional faculties." (p. 622.)

We are told by Dr. Nott, that among the inhabitants of the Southern States of America there is no acclimation against the endemic fevers of the rural districts, and that those who live from generation to generation in malarial districts, become thoroughly poisoned, and exhibit the thousand protean forms of disease which spring from this insidious poison. He thinks that the so-called acclimation of negroes has been overrated, and that they never, so far as his observation extends, become proof against intermittents and their sequelæ. Nevertheless, while the blacks in the United States have increased tenfold, those of the British West Indies have diminished in the proportion of five to two. According to Dr. Dowler, the blacks imported from Africa, everywhere beyond the limits of the Slave States of North America, tend to extinction. The Liberian experiment, the most favourable ever made, is no exception to this general statement. During thirty-two years, the number of coloured persons sent to Liberia amounted to 7592, which number was reduced to 7000 at the end of that time.*

Cretinism is regarded by M. Morel as a degeneration closely connected with localities in whose soil *magnesian limestone* forms an important item, though he does not deny that it may be found in connexion with other geologic formations. Our author is inclined to the opinion also, that a "deleterious miasma," acting as "an intoxicating agent on the nervous system," is evolved under the particular circumstances, and gives rise to the affection. The reader will find in our sixth volume, page 381, some details worthy of remembrance when perusing the portion of M. Morel's treatise which bears on cretinism.* Whatever may be the cause of it, of its being a profound state of vital degenerescence there can be no doubt.

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* See an article on the "Races of Men" in the North American Medico-Chirurgical Review for September, 1857.

Under our *third* category ranks the "great town system" as a degenerating influence on the race. What this system includes, and what its effects are, none know better than those acquainted with London, Liverpool, and Glasgow. Impure general and local atmospheres, likened by our author to *malaria*, form one of the most prominent factors in the sum. This analogy of M. Morel is less to be wondered at, when we consider how great towns are generally built near muddy rivers, provided with abundance of damp surface-soil, decomposing refuse vegetable matter, &c.; to these must be added the effects of stagnant rain and water slowly evaporating from the warmth of the sun, or from the heat of innumerable flues and fires. Other well-known deleterious elements in this system are the ill-lighted, ill-ventilated dwellings, insufficient or impure nutriment, the abuse of alcoholic fluids, and consequent intellectual and moral misery and crime. It can then be scarcely wondered at, that this system is amply prolific of scrofula, tuberculosis, rachitis, and even what is termed *cretinism* by some. The men become pale, low in stature, and beardless; the women frequently abort, or suffer difficult parturition; and the children die off early, or grow up with arrested development, glandular disease, and curved spines. The influence of insufficient nourishment generally, of years of famine, and of exclusive diet (as the use of the potato in Ireland, the vegetarianism of the *Chartreux*, &c.), in degrading the race and lessening the population, are ably discussed by M. Morel.

Under a *fourth* head, are included as causes of degeneration certain well-known fundamental morbid states and diatheses, either hereditarily bestowed upon, or afterwards acquired by, the offspring or person. We are precluded from entering into details upon their causes, but may just observe, that it is clear a child born with a brain incapable of fulfilling its due degree and normal kind of activity must remain degenerated, and that although the privation of two senses so important as sight and hearing cannot be compared in its consequences with certain other infirmities and arrests of development, it is not the less true that those so afflicted, if abandoned to themselves, must continue essentially "incomplete beings."† The empoisonment of the system by the syphilitic virus, the sway in it of the scrofulous, rheumatic, gouty, &c., diatheses will at once be admitted to be important sources of degeneracy, both to the individual and to the race. For ample illustration of the effects of syphilis we may refer to Dr. Whitehead. M. Morel alludes in a note (p. 560) to the asserted effect of *vaccination* in giving rise *per se*, or as the medium of conveyance of other deleterious influences, to depraved states of the infantile economy. This is a view more popular than professional, and one which our author does not accord with.*

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* The subject of cretinism is again discussed by M. Morel in the explanation of the plates of his "Atlas" (p. 22). The reader will there meet with some important observations on the *nature* of this degeneration.

† See also, besides M. Morel's Treatise, "The Land of Silence and the Land of Darkness." By the Rev. B. G. Johns. London. 1857.

Mr. Whitehead makes the following remarks:—

> "That vaccination may sometimes constitute the medium of introducing the venereal, as well as some other poisonous principles, from one into the system of another, would appear *à priori* sufficiently reasonable; yet has the possibility of such transference through this channel been strenuously denied. I have even heard it said that vaccine virus, taken from any child—whatever the nature of its constitution, or that of its parent or parents may be—can be safely used, provided the vesicle affording it be well formed and of healthy appearance at the time of its maturity. Case xxviii., however, affords, in my opinion, ample evidence tending to a positive conclusion on this subject, and is as weighty with me in its practical bearings as if a hundred instances of the kind had happened in like manner." (p. 263.)

Bichat long ago asserted, that although numerous causes might exist to produce debility of the system, in coincidence with the presence of the *beard*, yet the general impression must be that there exists "un certain rapport entre elle [la barbe] et les forces." It is probable, says the great physiologist, that the muscular energy is, up to a certain point, connected with the presence of the beard, and that this energy diminishes always a little when a man habitually deprives himself of that appendage. "*Tout le monde connait la vigeur des anciens, celle des peuples à barbe longue, celle même de certains hommes qui parmi nous laissaient croître leur barbe par les lois d'une institution monacale.*" This same doctrine has lately been promulgated by Dr. Calvert Holland,† who maintains that—

> "Cutting the beard as it grows is not only absurd, but frequently prejudicial to the healthy condition of organs more or less interested in its development. . . . . The beard is the distinguishing appendage of man, and has generally been uncurbed in its growth in those nations which have in succession been pre-eminent for valour and influence of character. . . . . The beard uninterrupted in its growth is more intimately associated with the mental powers, affecting their manifestation, than may be supposed possible at first," &c. (*Op. cit.*)

Not only must the causes of degeneration be studied in their isolation, but also as respects their admixture and combined operation. Under the head of "Mixed Causes," M. Morel institutes such inquiry. In this division, also, the effects of the contact of the European with other races, the crossing of races, the admixture of breeds, consanguineous marriages,‡ &c., are alluded to by the author in an interesting and instructive manner. Under this department of our subject the following extracts from Dr. Whitehead, which we had marked for quotation, will find apposite locality:—

> "A lady in reduced circumstances had borne four healthy children at full term. She possessed a robust constitution, and was descended from a healthy

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* See "Medical Circular," 1857, vol. i., p. 188, for a very extreme view of the bad effects laid at the door of vaccination.

† "The Constitution of the Animal Creation, as expressed in Structural Appendages," (p. 71). London. 1857.

‡ For some valuable observations on "Marriages of Consanguinity" we may refer to an article by Dr. Bemis, of Louisville, in the North American Medico-Chirurgical Review for January, 1857.

stock, both as regards body and mind. Her husband and his family had been similarly favoured; but he, from being a faithful and affectionate companion, became dissipated and cruel. When five months advanced in her fifth pregnancy, the unkindness she received from her husband threw her into a state of great mental distress and despondency, during the prevalence of which she attempted to destroy herself by drowning, but was opportunely rescued. She was delivered at the full term of utero-gestation of a boy, who survives, but who is completely imbecile. She then bore a healthy female child, who also survives, and is perfectly healthy. She had then an abortion in the fourth month, and died, nine months afterwards, of malignant disease of the uterus. Neither idiocy nor malignant disease had been previously known in the family of either parent." (p. 20.)

"Setting aside the moral evils likely thence [intermarriage within a limited sphere,] to arise, such as the facilities afforded for contracting early marriages, and for perpetrating illegitimate intercourse, it is generally admitted that such alliances, often and indiscriminately repeated, tend inevitably to the deterioration of the race. I am aware that this doctrine has been strongly opposed; but the results of observation go to substantiate what is here advanced. . . . It is not improbable that a succession of evils arising in this manner necessitated the enactment of that portion of the Levitical code which prohibits intermarriage within certain degrees of kindred—a law which has been respected with tolerable exactness in most civilized countries to the present day." (p. 4.)

We must now convey to the reader M. Morel's deduction—that the continued subjection of the organism to the various deleterious influences we have pointed out, gives rise to degenerations, each impressed by a particular character, although there exist certain general characters belonging to the different categories we formerly laid down. The distinctive elements, according to the author (p. 71), are not alone based upon external dissemblances, but likewise on internal ones, resulting from the greater or less state of integrity of the nervous system, and of the sensory apparatus. No *absolute* classification, it is true, of different types of degeneration can be maintained; but such demarcations can be shown to exist between them as can be drawn between the different varieties of men. The latter, according to M. Morel (p. 73), constitute the "naturally transformed races," whilst the varieties of the degenerated human species form the "morbidly transformed" ones. In these latter

"The deviation from the normal type of humanity continues to be revealed in succeeding generations by *external* and *internal* signs, the more alarming, perhaps, since they indicate the weakness of the faculties, the manifestation of the worst tendencies, and the limitation of the intellectual life to a certain period beyond which the individual is incapable of fulfilling a function in humanity. . . . The organic lesions, the result of intoxication and other causes of degeneracy, present themselves both under an acute and chronic form. In the acute state the deleterious action may be so rapid that the most minute microscopic inquiries may be unable to reveal an appreciable organic lesion. In the chronic . . . . it operates progressively, raising up an invariable assemblage of symptoms. . . . . The lesions both of the physical and moral spheres that we have signalized in the individual, suffice to constitute in him a state of degeneration, and to induce those conditions, in which degenerated beings can no longer unite together and propagate in common the great and *unique* family of the human race." (p. 333.)

Since it belongs to the separate provinces of pathology, morbid and comparative anatomy, to definitely and minutely establish the organic and congenital lesions induced by degenerative influences, M. Morel touches but cursorily on these points. He has, however, given an "Atlas" of plates admirably illustrative of some important changes in the physiognomy, form of the head and trunk, &c., exhibited by certain types of degenerated beings.

> "The manner in which I have regarded the great and important question of the sick man and of the man decayed [dechu], has involved a threefold view: the alteration of the organic functions and the transformation of pathologic phenomena reciprocally engendering and commanding; the degenerative tendency, congenital or acquired, of the individual subjected to the influence of certain determinate causes; and, finally, his confirmed degeneracy, which, in its turn, perpetuates itself with fixed and invariable characters in his descendants." (p. 682.)
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> "These lesions are visible and palpable; it is impossible not to refer them to their origin; we may recall that the circulatory energy, even in the morbid condition, is never inactive, and if it modifies or hinders the development of organs, it can create in the latter a pathologic tendency manifesting itself externally under the form of abnormal, and, so to speak, of new productions equally transmissible hereditarily.
>
> "I include in these productions certain morbid deviations of the species which have been designated monstrosities, such as *albinism*, *elephantiasis*, *goitre*, and other anomalies which we have only incidentally touched upon, but sufficiently so as to be able to apply to their causation the theory of the 'degeneration of the race!' . . . The *insane* who fill our asylums are, for the most part, representatives of the products of degenerative causes existing in the social state." (p. 355.)
>
> "Goitre, deaf-mutism, rachitis, imbecility, and idiocy, scrofulous and tuberculous affections, hernia, chronic gastritis resulting from imperfect nourishment, arrest of physical and intellectual development, infecundity, general degradation of the mental powers, are the diseases, the infirmities, and degenerated states which exist concurrently with *cretinism*." (p. 678.)

Finally, upon these points M. Morel observes:—

> "I have laid down a proposition in the *prolegomena* that I here and again maintain in its integrity. I have said: The progress of degeneration resulting from the union of individuals more or less stamped by degeneracy, may attain to such limits that humanity is alone preserved by the very excess of the evil. The reason of such is easily seen: The existence of degenerated beings is necessarily limited, and, wonderful to say, it is not always necessary that they arrive at the last degree of degradation in order to be struck by sterility, and consequently incapable of reproducing the type of their degeneration." (p. 683.)

The last chapter in the work is entitled "Practical Inductions—consideration of the Method of Studying the Regenerating Elements in the Human Race." It is but a short one, as the important points it deals with are intended to be specially treated of in a work ("L'Hygiène, Physique et Morale") afterwards to appear, as the necessary complement to the present highly interesting treatise. The space we have accorded to the notice of the latter is the best proof we can offer M. Morel for the favourable opinion we have formed of his labours.

In conclusion, we may recommend Dr. Whitehead's treatise chiefly as illustrating the influence of the syphilitic poison, and this rather on the *individual* and his family than on the *race*. With respect to Dr. Knox's "Fragment," we would say that whilst it undoubtedly displays not only deep anatomic, physiological, and artistic knowledge, served up with a dash of genius and flow of speech, it has some serious blemishes, by which, however, we will not allow our equanimity at present to be disturbed. One problem the author has striven at, viz., the application of the doctrine of the diversity of races to social, historic, and other "things human and divine," is a problem, no doubt, of great difficulty, and a fertile source of dispute. But notwithstanding all allowances to be made on this ground, we must accord in that opinion which has affirmed that in this "Fragment" a term of sacred import—*civilization*, has received such a limited application, that a benevolent spirit is ill disposed to admit, without entering a protest ere judgment be finally delivered.

REVIEW V.

1. *Report on Murrain in Horned Cattle, the Public Sale of Diseased Animals, and the Effects of the Consumption of their Flesh upon Human Health.* Addressed to the Right Hon. the President of the General Board of Health. By E. HEADLAM GREENHOW, M.D., Lecturer on Public Health at St. Thomas's Hospital, &c.—*London*, 1857. pp. 78.
2. *The Cattle Plague and Diseased Meat, in their relations with the Public Health, and with the interests of Agriculture.* A Letter to the Right Hon. Sir George Grey, Bart., &c. By JOSEPH SAMPSON GAMGEE, Staff-Surgeon of the First Class, and Principal Medical Officer of the British Italian Legion during the last War, &c., &c. —*London*, 1857. pp. 41.
3. *The Cattle Plague and Diseased Meat, &c.* A Second Letter to Sir George Grey. By J. S. GAMGEE.—*London*, 1857. pp. 26.
4. *Report on Unwholesome Meat, by a Committee of the Metropolitan Association of Medical Officers of Health.*
5. *On the Measle of the Pig; and on the Wholesomeness, as Food for Man, of Measly Pork.* By ALEXANDER FLEMING, M.D., Professor of Materia Medica, Queen's University, Ireland.—*Dublin*, 1857. pp. 8.

THE prevalence of disease amongst cattle, especially of fatal disease, may be regarded in several points of view as related to public health. The same causes which promote sickness in the lower animals may with just reason be suspected of favouring disease amongst ourselves; the destruction which a murrain produces may, by increasing the price of animal food, almost prohibit its use to a large portion of the community whose health may pay the penalty of the deprivation; the quality of the food supplied may be deteriorated; or lastly, the flesh may acquire properties rendering it absolutely injurious to the consumer. We propose to limit our present remarks to the last of these possibilities, while endeavouring to define the amount of real knowledge we possess upon the subject. We shall in the last place offer some observations upon the propriety of improved legislation for the protection of public health in connexion with this element of disturbance.

The price at which the poor are supplied with meat, and the fact that a profit can be drawn from the sale of sausages, &c., at a rate much below the ordinary prime cost of the article out of which they are supposed to be manufactured, are in themselves sufficient proof that the source from which such food is procured must be exceedingly questionable. The consumers of this cheap food belong to the very class of persons who crowd the waiting-rooms of our hospitals and dispensaries, and whose rickety and scrofulous children are seen in every court and alley of our metropolis; it is the class which furnishes every summer the largest proportion of cases of diarrhœa, and out of which from time to time cholera principally selects its victims. It is then of the highest importance to discover, if possible, whether the consumption of this cheap meat directly occasions illness in those who eat it, or operates indirectly by creating a proclivity to disease. When a medical man is asked his opinion upon the influence of "diseased meat" upon the health, the usual reply is that "no doubt it is injurious," that "such food cannot be wholesome," that "there is no question it is one of the causes of summer diarrhœa,"—and so on. We have made numerous inquiries of this kind with a view to eliciting information, but we find that nothing can be more indefinite than the notions commonly held by professional men upon the matter, and that, with the single exception of putrid meat, they are not founded upon the results of observation so much as upon preconceived ideas of what ought to be. About a year ago, the Metropolitan Association of Medical Officers of Health appointed a committee to obtain information calculated to guide those whose duties imposed upon them the seizure of unwholesome food. The inquiry was conducted in a very cursory manner, and consisted in little more than an examination of the practice of the officers of the City of London in their seizures at the markets. We quote from the Report now, not to criticise the document, which was hurriedly prepared at the commencement of the hot season of the year, and was only intended to be preliminary to further investigation, but because it expresses the opinion ordinarily held both within and out of the profession :—

> "Your committee may observe, that, although it may be difficult to prove it by actual cases, they have no doubt that unwholesome meat is one cause amongst many of the debility and cachexies, the poverty of blood and intractable maladies of the poor who flock to the dispensaries and parochial medical officers, and especially of diarrhœa during hot weather."

The committee here refers to "the flesh of animals in a state of disease, and not to meat which has become putrid from having been over kept." The Report proceeds :—

> "But your committee feel that this is a question which must be argued on far

higher ground than that of special ill consequences; they believe that public decency demands that a stop be put so far as possible to the sale of the flesh of diseased animals and of those which have died a natural death. They appeal to that highest and best sanitary code contained in the law of Moses, which they would willingly see observed at the present day."

Mr. Gamgee, who has addressed two Letters upon the subject to the Home Secretary of State, has taken great pains to discover the facts relating to the sale of diseased meat in London; and his revelations cannot fail to excite disgust. Medical men, however, must of all people be careful not to permit their judgments to be warped by a feeling of this nature; but are bound strictly to inquire into the proofs or probabilities of unwholesomeness before committing themselves to the condemnation of all meat derived from animals dying of disease, or slaughtered in anticipation of death. Mr. Gamgee describes what he saw one day when visiting the Metropolitan live-cattle market:—

"The live beasts were generally extremely well-conditioned and thoroughly sound, but standing amongst them were three diseased beasts. One of these was emaciated and hide-bound, with abscesses in various parts of the body, particularly over the region of the head and neck. From the clinical observations I made on diseased cattle nine years ago, I believe this case was most probably one of pyæmia following typhoid fever. A second beast was in ill health, viz., thin and feverish; but I could not make a precise diagnosis. The third beast was a fat one; it was lying down, moaning, looking round anxiously at its flanks; pulse 110; respiration 45; pleuropneumonia." (p. 6.)

The London cowhouses supply to the market the greater proportion of these animals. Mr. Greenhow has ascertained, and our own inquiries confirm the truth of his statements, that it is the practice thus to dispose of sick cows. They are usually sent to market, however, at an early period of disease, as soon as they fail in giving milk, and before they become emaciated. But there is no stage of disease in which the animals will not find a purchaser, there is none in which they are not slaughtered for food, even when their disease is so advanced as to render it impossible to drive them to the public market. The following extracts from Mr. Gamgee's First Letter indicate the destination of the diseased beasts:—

"On Monday, the 16th inst., I inspected one of the slaughter-houses at the New Islington Cattle Market. In it I saw five carcases, three of oxen, two of sheep. One of the latter was of magnificent shape and condition, so far as fat was concerned, but the whole carcase had a uniform dusky red colour, evidently the result of general infiltration with bloody serosity. The carcase having been trimmed and completely dressed for the butcher, I had no means of inspecting the viscera. Two of the oxen were much emaciated, and had apparently died from typhus or typhoid fever: they presented numerous bloody extravasations into the subcutaneous intermuscular and sub-pleural cellular tissues. . . . . The third ox was large, moderately fat; pleuropneumonia. . . . . The slaughterman stated that these carcases would be conveyed to the City markets, where they would be *sold as food.* In his opinion those carcases were not diseased, nor would they be considered such by the City meat inspectors." (p. 9.)

On another occasion there were three carcases of very old lean cows:—

"The flesh was pale, nearly white, extensively ecchymosed, the cellular tissue inflated with gas; in the buttocks of the beast which was being trimmed were huge masses of putrid, bloody, and disintegrated muscle,—the whole appearances were those of advanced typhoid disease." (p. 10.)

Again, on one Saturday afternoon at Newgate Market—

> "The quantity of diseased meat most unquestionably unfit for human food was very large; what I saw in half an hour would have laden a single horse cart. Amongst other specimens I saw at the back of a little dark shop, a very thin, pale fore-quarter of beef, extensively ecchymosed, for which I was asked three pence per pound; in another place a saddle of mutton, the muscle of which was pale and pappy, the scanty fat moist and deeply tinged with the characteristic yellow of bile; many legs of mutton and huge pieces of beef were either in an advanced stage of putrefaction, or bore unmistakeable marks of organic disease." (p. 12.)

In addition, it has been ascertained that much diseased meat is slaughtered in the country and brought up ready dressed for sale to London, and that much of this "hazardous" meat is sold by respectable (!) tradesmen. The insurance offices for cattle appear to have a hand in this business. Graziers and cow-keepers are required to give information at the offices of any disease which may attack insured beasts, and on pain of forfeiture of their right to compensation for loss must obey the directions they receive for the sale or slaughtering of the sick animals:—

> "There are three insurance offices in London in which graziers can insure their beasts from disease: it was the practice of one of these offices to send the insured animals dying from disease to their own slaughter-houses, situate 160 miles from London, to be dressed and sent to the London markets. The diseased animals when dead become the property of the insurance company."*

Now, is this meat from diseased animals or from beasts dying spontaneously from acute or chronic maladies, unfit for food? does it produce disease either directly or indirectly, when consumed by man? The Committee of Health officers asserts that there is "no doubt" about it. Mr. Gamgee "is firmly convinced" that it is so, and he thus states the reason for his belief:—

> "Numerous authorities attest that such alimentation may be, and often is, productive of the most baneful results, even unto speedy death. The fact that many persons have often subsisted on animal food of the worst kind is no more an argument against the injuriousness of such alimentation, than would be a plea for the harmlessness of a cholera or intermittent atmosphere, founded on the fact that a large number of persons may breathe it without apparent suffering. The fair presumption is that from impure materials the sustenance of the human body cannot be derived without risk; and accordingly experience teaches that, although by the marvellous organic and functional provisions of the animal economy, injurious influences from without are in great measure counteracted, yet impure air, water, or solid aliment cannot be introduced into the system without weakening the vital powers, and often without the most disastrous immediate results. Moreover, it is most fair to argue that the number of cases of illness referable to the eating of diseased meat is even much greater than that recorded in the annals of science, it being impossible in very many instances to trace back the causes of a disease, and to ascertain what kind of animal food has been partaken of."†

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* Dr. Greenhow's Report, p. 47.

† First Letter, p. 28.

The result of adopting this view of the matter would be an interdict upon the consumption of the flesh of *all* animals slaughtered in a condition of disease, and thousands of the poorer inhabitants of our large cities, being unable to pay the price demanded for the best qualities of meat, would probably be deprived of animal food altogether. To a great extent, we ought to be guided in our condemnation of such meat by the actual observation of its effects when eaten; and in the absence of positive proof of injuriousness, the hypothesis propounded by Mr. Gamgee may fairly be urged as applicable where the disease under which the animal suffered was one deeply affecting the blood, and through it all the solids and fluids of the body. There will still be left many diseases the presence of which we hold should be no ground for absolutely condemning the meat as injurious; but in the case of such meat certain precautions are necessary, which we shall presently point out.

The Report of Dr. Greenhow has reference only to those diseases which are prevalent at the present time, as *murrains* among the horned cattle in England and the countries on the European continent. Of these he enumerates four—three confined to the Continent, and only one, the "pulmonary disease," or "pleuropneumonia," common to England and the Continental states. Since the year 1841, this "lung disease" has, in England, been very fatal both to horned cattle in the fields and to cows confined in sheds. It is the disease which supplies the largest quantity of questionable beef to the London markets at the present time. The other diseases mentioned, which do not occur epidemically in this country, are the steppe-murrain, or "Rinder-pest," a typhous disease spreading by contagion, but for satisfactory reasons, fully discussed in the Report, not likely to be introduced here; the "dysenteric murrain," choleraic in its character, which during the late war committed serious ravages among bullocks purchased for the use of the army from the interior of Asiatic Turkey; and the "carbuncular murrain," "Millz brand," or "black-pock." This last is a typhous disease, originating in horned cattle, but communicable to other animals and to man, and characterized by an eruption of gangrenous carbuncles in various parts of the body. Of these four prevalent diseases only one, the carbuncular disease, is communicable to man by eating the flesh. The foreign journals abound in proofs of this; and a long string of authors are quoted by Dr. Greenhow, substantiating its fatal operation. But it does not appear that this injurious effect is invariable. There are several instances on record in which the cooked flesh has been eaten with impunity, notwithstanding that the persons who have handled the raw flesh of the same animal have thus become infected with the disease.

Some writers, and especially M. Rénault,[*] have insisted strongly on the efficacy of heat in destroying the contagious properties of this as well as of other virulent matters of a similar kind. He found that such matters became inoperative after cooking or prolonged ebullition, whether subsequently swallowed or introduced into the system by inoculation. It has hence been suggested that the contradictory facts, as to the poisonous operation of this meat, might be explicable on the assumption that where the disease has been communicated the food was imperfectly cooked; a condition in which we can readily comprehend the contagion to be communicable through the mucous membrane as perfectly as through the skin. A case related by Verhayen,* however, is on this theory by no means easy of explanation. In 1812 the disease we are considering broke out in the district of Turckheim, in Bavaria. The first sick cow was slaughtered and the meat boiled. The persons who ate of it were not inconvenienced, but a woman subject to cramps of the stomach only took some of the broth; violent vomiting and acute abdominal pains supervened, a swelling such as characterizes the malady appeared upon the chest, syncope followed, and cold sweats with meteorism of the abdomen preceded the fatal result. It is not unlikely that feeble doses of the poison may be inoperative on individuals with strong digestive faculties, but that this woman fell a victim in consequence of her feeble powers of resistance. In some cases which have been recorded, the symptoms which have followed the use of meat from these animals have been merely those of gastric irritation, no carbuncular disease having become manifest in the sufferers. Such symptoms, however, are not peculiar to the use of diseased meat of this character; they may arise after eating meat from animals who have been slaughtered while suffering under other maladies, or even from healthy beasts. Many of these instances are explicable by the meat being in an incipient state of putrefaction; and it is well established that in this, as in other forms of murrain, the carcases of the dead beasts pass rapidly into decomposition.

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[*] Rec. de Méd. Vét., 1851, p. 878.

With regard to the other maladies mentioned, there is no satisfactory evidence that the flesh of animals dying with them is *per se* directly prejudicial to health. To show the immediate harmlessness of meat from animals with contagious typhus, we quote the following from Dr. Greenhow's Report:—

> "Large numbers of oxen and cows suffering from a typhous epidemic followed the Allied army to Paris in 1814. The entire population of Paris and the suburbs, including the troops which surrounded and occupied the capital, fed upon the meat of the diseased animals for two months without any increased amount of sickness, or the production of any epidemic disease. None even of the animals that died were lost. M. Coze, senior, who made extensive and precise observations upon the effects of meat derived from diseased cattle, relates that a thousand large oxen suffering from typhus were consumed by the Allied and French armies, and by the inhabitants near Strasburg, in 1815. Many of the animals were slaughtered when actually at the point of death, and their flesh was consumed for food. Yet this food produced no disease, and did not even disorder the digestive organs of those who used it." (p. 52.)

General experience is also in favour of the doctrine that no directly injurious effects follow upon the consumption of meat from animals suffering from the pleuropneumonia now prevalent in this country. The inspector of meat for the City of London is quoted as asserting that much of the meat from animals who have had pulmonary disease is of first-rate quality; and slaughtered, as the beasts usually are, during the first days of the illness, we can understand that the appearance of the meat would have undergone little if any alteration. From the extent to which this form of murrain has prevailed in England, it is highly probable that M. Verhayen is not far wrong when he says that pneumonic beef appears upon the tables of the rich as well as of the poor; that there is no one who has not eaten it, and will not eat it again.

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* Rec. de Méd. Vet.

Evidence of direct unwholesomeness is equally wanting in respect of meat from animals with other inflammatory diseases. When, however, acute disease has run its full course or nearly so, or when animals have long suffered from chronic and emaciating maladies, such as phthisis or dropsy, the flesh, like the muscular tissue in man under similar circumstances, undergoes a change in appearance. It may become pale, soft, and watery, and is destitute of fat, while its smell may be altered from that of healthy meat. No one can question that meat in this condition is deficient in constituents essential to the nutritious character which such an aliment should possess, and that thus its continued use must exercise a prejudicial effect upon those who rely upon it for support. M. Verhayen asserts, moreover, that such meat from dropsical and phthisical animals is indigestible, and produces diarrhœa in those who eat it.

In estimating the unwholesomeness of diseased meat, there are two conditions which must always be kept in mind. One of these is the tendency to putrefaction which such meat exhibits. As long as a century ago, when a pulmonary murrain, similar to that now prevalent, prevailed, Dr. Brocklesby pointed out this source of unwholesomeness, and advised that meat should be kept for three or four days as a test of its adaptation for food. There are abundant facts to show that meat in a state of putridity is capable, especially with persons of weak digestion or unaccustomed to its use, of producing directly injurious effects. Dr. Greenhow illustrates it by several examples in which either gastro-intestinal derangement or typhous symptoms resulted from its use. The experience of most medical practitioners can furnish additional instances. It does not appear that an advanced stage of putrefaction is necessary to render meat deleterious. Probably, also, the form of decomposition undergone may have something to do with the specific character of the disturbance produced. Diseased meat, harmless if eaten while fresh, may become quickly unwholesome from this cause, atmospheric conditions favouring or retarding the change.

Another cause of unwholesomeness in diseased meat may arise out of the previous administration of medicines to the sick animal. This source of harm to the consumer is alluded to both by Dr. Greenhow and Mr. Gamgee. "Physic meat," as it is technically termed, is invariably seized in the City markets, where the substances employed are detectable by the smell. The most dangerous meat that would come under this designation is derived from animals to whom mineral substances have been given, which are known to circulate in the blood through every tissue of the body, and which confer upon the flesh their own poisonous character. Meat thus impregnated is not discoverable by any peculiar odour, and it is highly probable that many an attack of vomiting and diarrhœa has had its origin here, which both doctor and patient have been at a loss to account for. Mr. Gamgee refers to a case of this kind, where the poisoning arose from eating the flesh of an ox which had been treated with tartar-emetic. This drug has been regarded as particularly applicable to the treatment of the "lung disease." Happily, perhaps, for the public, both the country graziers and the London cowkeepers are beginning to doubt the expediency of any active treatment whatever, and are disposed either to slaughter the beasts at an early period, or to allow them to take their chance of life or death.

We must not pass over another kind of diseased meat of which Dr. Fleming's pamphlet reminds us—"measly pork." The flesh of swine containing the *Cysticercus cellulosæ*, which finds its favourite seat of development into the *Tænia solium* in the alimentary canal of the human subject. The proofs of this connexion have been so recently discussed in the pages of this Review, that we need only call attention in this place to the high prophylactic position that careful preparation holds in respect of pork thus infected. The Report drawn up by Dr. Fleming will be read with interest in connexion with this point. The object to be attained is the destruction of the vitality of the parasite. It may be effected by the prolonged exposure to heat which perfect cooking involves; and, as Dr. Fleming shows, by the process of conversion into bacon.

It is one thing, however, to show that no mischief to the consumer has been proved to result directly from the use of the flesh of animals labouring under certain forms of disease, and to assert that such food may be eaten with complete impunity, both present and future. The difficulty in tracing the relation of cause and effect in the maladies of those who are the principal purchasers of such meat is so great, that a practical value must be conceded to general professional opinion and to popular sentiment upon this subject. The "presumption that from impure materials the sustenance of the human body cannot be derived without risk" is, within the limits of moderation, fairly applicable to direct our practice, and to determine the sort of interference and its amount, which may with reason be looked for from the legislature in controlling the sale and consumption of diseased meat. Science and common sense will not be found at variance; the former confesses imperfect information, the latter acts, as it always must act under such circumstances, by leaning to the safer side.

The "Report of the Association of Health Officers" points out the legal provisions already made to prevent the sale of diseased meat. Mr. Gamgee directs Sir George Grey's attention to the manner in which these salutary provisions are evaded, and calls for further restrictions. Dr. Greenhow discusses the causes of the pleuropneumonia now prevalent among horned cattle, and shows the improbability of the other murrains alluded to ever reaching this country, considering the insular position of England, the regulations in force in the countries through which they must pass to ourselves, and the inspection of foreign cattle set on foot as they arrive at our ports. It is quite clear, however, that something yet remains to be done in the interest of public health. A double duty is incumbent upon the State: the first is to ensure, as far as possible, a check being placed upon the progress of epidemic disease among cattle; the second to ensure that meat which, when slaughtered, is obviously unfit for food, shall not be applied to this purpose, but destroyed.

The general principles of preventive medicine, as applied to domestic animals, are based upon truths as well-established as those which are universally admitted to apply to ourselves. Cleanliness, atmospheric purity, and an appropriate alimentation, are essential to the well-being of both; where they are wanting, experience demonstrates that disease may be expected to prevail. The history of the cattle confined in the London cowhouses would suffice to establish this position. Cows newly-purchased from the country, exposed to the polluted atmosphere of the cowsheds, and supplied with the customary stimulating food, are the most apt to suffer from "lung disease;" and the probability of attack is greatest where the animals are most crowded, and where the ordure is retained within the sheds. Nor does the disposition to disease terminate here; for even if the animal becomes habituated to this mode of life, so prone is it to suffer from chill, that an attack of pleuropneumonia is very apt to result on sending it to pasture in the country. As these cowsheds furnish the Metropolitan cattle market with a large quantity of diseased beef which, if not in itself unwholesome, speedily becomes so from tainting; and as they are, besides, very commonly a source of annoyance to the neighbourhoods they occupy, it is much to be hoped that the legislature will in time see how desirable it is that these establishments should be forbidden in London, and in the midst of our populous towns. In the mean time, sanitary restrictions should be enforced. The animals should be supplied with sufficient breathing space in properly ventilated sheds; the latter should be kept thoroughly clean and well-drained, and the manure be entirely removed from the sheds and premises every day. The contagious nature of the "pulmonary disease" has been a subject of much discussion. That it does not spread mainly by contagion appears very clear; and many animals escape who have been freely exposed to it by lying in the same stall, and feeding out of the same trough, with a diseased beast. Still the facts appear to warrant the advice, that the sick animal should be separated from the healthy as soon as the disease appears. One attack of lung disease, even if slight, seems to render the beast insusceptible of a second seizure. Inoculation with the liquid obtained from the lungs of oxen affected with the pulmonary murrain has also been recommended as a preventive measure; while deficient in scientific basis, the results of the practice are far from satisfactory. The subject is discussed at length in Dr. Greenhow's Report, to which we must be content to refer our reader.

If cows cannot be kept in large towns without risk of offence and injury to the community, a prohibition laid upon them would apply with still greater force to the keeping of swine; not only on account of the intolerable abominations upon which they are fed, and the disgusting manner in which they are invariably lodged, but from the impossibility of carrying out, in the midst of a populous neighbourhood, the other sanitary measures by which measly infection of the flesh is to be avoided.

> "It is highly probable, if not quite established, that 'measles' originate in the eggs of the tapeworm which infests the bowels of the dog. Each mature joint of the last parasite contains many thousand eggs. These when voided by the dog are resolved into a fine dust, and are scattered by the wind; and thus mixing with the food or drink of the pig, enter its body, and are there converted into the 'measle' or flesh-worm, which, as already stated, is an imperfect condition of the tapeworm. 'Measles' may not form in every hog that has swallowed tapeworm eggs, while a feeble digestion and constitutional debility may especially favour their hatching in some pigs. If this view of the origin of measles be correct, it will be an important and rational guide to the prevention of the disease, and which will consist in providing the pig with thoroughly clean food and drink, promoting its general health, and removing it from the neighbourhood of dogs affected with tapeworm."*

The sale of unwholesome meat is an offence indictable at common law, but protection is also afforded to the public by several special enactments. By virtue of an act passed in 1848 "to prevent the spreading of contagious and infectious disorders among sheep, cattle, and other animals," which was extended and amplified in 1853, any officer of any market or fair, or any constable, or any other person authorized by the mayor or any two justices of the peace having jurisdiction in the place, or by her Majesty in Council, may seize all sheep affected with smallpox, or any meat unfit for human food which shall be exposed or offered for sale in any market, fair, or public place, reporting such seizure to the mayor or justice, who may condemn the meat and fine the offender. The "City of London Sewers Act, 1851," provides for the appointment of inspectors of slaughter-houses and meat, with summary powers of seizing and destroying any meat which may appear unfit for food. The "Metropolitan Market Act, 1851," gives full powers over unsound meat to all clerks and inspectors appointed by virtue thereof. Similar powers of seizure are given to the officers of local authorities by the "Nuisances Removal Act for England, 1855," an act which it is in London the duty of the vestries appointed under the "Metropolis Local Management Act," to carry out. The power of inspection and seizure is extended to every kind of animal and vegetable food, and to meat, whether exposed for sale or in process of slaughtering, dressing, or preparing for sale or use, or landed from any ship or vessel in any port in England. But with all these legal provisions bad meat is still sold not only in the suburbs of London, where hitherto no effort has been made to repress the trade, but, according to Mr. Gamgee's statements, even in the centre of the metropolis, where special inspectors are appointed to prevent it. Probably were there no show of inspection, the condition of the shops would in this respect be much worse, and it doubtless is worse beyond the limits of the City jurisdiction, where local influences and partialities, ignorance and sanitary apathy, a stingy economy and dread of unpopularity, tie the hands of the administrators of the law. The fault does not lie in the magistracy, who invariably convict on a clear case being made out, but in the local boards with whom it lies to initiate proceedings. An inspection of meat and slaughter-houses, to be efficient, should be active, and conducted by men whose antecedents have fitted them for the work. There are two practical difficulties which occur in the administration of these Acts, and which we have ourselves experienced in respect to that last mentioned. The first is to decide what meat should be included under the condemnatory appellation of "meat unfit for the food of man." Doubtless in many instances no question about the unfitness can arise, but it will be at once seen from our previous remarks that the inquiry is not superfluous, inasmuch as individual opinion and prejudice may influence the reply, and thus on the one hand the public may be supplied with meat which cannot be eaten without risk, or on the other be deprived of food from which, if eaten with certain precautions, no injurious effects can be expected to proceed.

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* Dr. Fleming on Measle, &c., p. 3.

The following kinds of meat will be readily conceded to be totally unfit for food, and the sale of which should be absolutely prohibited:

Meat certainly known to be productive of disease, or such as, in the absence of positive proof of unwholesomeness, general professional opinion condemns as so impure in its origin that it cannot be applied without risk of health to the sustenance of man. In this definition would be included, absolutely putrid meat, and meat the odour of which is disgusting, although it may not be tainted; wet, pale, flabby meat, resulting from exhausting illness, a dropsical cachexia, &c.; the flesh of animals known to have died with carbuncular or other putrid diseases, where the whole mass of solids and fluids has undergone a deeply morbid change; the flesh of poisoned animals, and, where it is ascertained, of sick animals which have undergone treatment with mineral or other deleterious drugs; pork badly measled; to all which must be added all parts of animals which exhibit pathological changes in their tissue.

There is another class of meat, however, which though derived from diseased animals there is no reason to consider unwholesome if well cooked and eaten when fresh. As it is commonly sold at a cheap rate to those who would eat no meat were it not cheap, it would be both impolitic and unjust to prohibit the sale. At the same time the sale should be under surveillance, as the meat is of a character which may soon become unwholesome from putridity, especially during the hot season of the year. Such is meat from animals dying of accidents, and the unaffected parts of animals slaughtered in the early stages of acute inflammatory affections. The second practical difficulty we find is in exercising the vigilance necessary to protect the public from the ill effects of such meat which is ever on the point of passing into the class of "unwholesome meat." And here we feel that further aid is demanded from the State. While this "hazardous" meat is distributed with wholesome meat through the numerous shops even of a small locality, it is impossible to watch or to control its sale. If public policy require that it be not withheld as unsound, the purchaser should not be deluded by the idea that he is buying meat of unquestionable wholesomeness. Its character should be honestly proclaimed, and the public should buy it, knowing its nature, and the importance of consuming it early and well cooked. This, and the necessary watchfulness over it by the sanitary inspectors, can only be effected by a regulation which shall prohibit its exposure for sale side by side with undoubtedly good meat. In every town or market, certain places should be set apart for its reception, and the exhibition of it in any other place should be made punishable as an offence. We know no other mode in which the difficulty can be overcome. Pork slightly measled might also be sold under restriction, but never in the raw state or until the vitality of the parasites it contains 'has been destroyed by effectual curing, or by thorough baking. On no account should measly pork be permitted to be made into sausages, which are almost invariably eaten by the poor in a half-cooked condition.

The prosecution of this scheme would involve the appointment of inspectors with qualifications very different and superior to those of the persons who at present exercise this function. It would involve also the suppression of all private slaughtering, which although an inconvenience to butchers, would be in many points of view an advantage to the public. At present dead meat of the worst quality readily finds its direct way from the country to the butcher's shop; this also could no longer be allowed until it had passed the ordeal of inspection in the public market, or had been certified as sound from the place where it was slaughtered.

In drawing to a conclusion, we are bound to confess that we have treated this important subject less extensively than the questions involved in it demand; but there was no choice between writing what would have been rather a treatise than a review, and limiting ourselves strictly to the matters discussed in the pamphlets at the head of the article. But even these few remarks will not be without a value, should they merely serve to show the deficiencies in our knowledge, and form the basis for further inquiry.

Review VI.

1. *Outlines of Ophthalmology.* Third Edition. To which is prefixed an Introductory Discourse on the Causes which have rendered the Eye a separate Object of Medical Study. By William Mackenzie, M.D., Surgeon Oculist in Scotland in Ordinary to her Majesty; Lecturer on the Eye in the University of Glasgow; and one of the Surgeons to the Glasgow Eye Infirmary.—*London*, 1856. pp. 72.
2. *A Catechism of the Medicine and Surgery of the Eye and Ear, for the Clinical Use of Hospital Students.* By T. Wharton Jones, F.R.S., Professor of Ophthalmic Medicine and Surgery in Univer-

sity College, London; Ophthalmic Surgeon to the Hospital, &c. —*London*, 1857. pp. 131.

3. *Return of the Principal Operations on the Eye performed during the Years* 1848, 1849, 1850, 1851, *in the Calcutta Eye Infirmary.* By Surgeon W. MARTIN, Superintendent Calcutta Eye Infirmary.—*Calcutta*, 1853.
4. *The Structure and Functions of the Eye, illustrative of the Power, Wisdom, and Goodness of God.* By SPENCER THOMSON, M.D., L.R.C.S. Edin.—*London*, 1857. pp. 272.
5. *Ophthalmic Hospital Reports, and Journal of the Royal London Ophthalmic Hospital.* Edited by J. F. STREATFIELD. Oct., 1857. No. I.*

OPHTHALMIC science in Great Britain is of recent growth; within the recollection of men now living, the diseases of the eye were considered to be a speciality infinitely beneath the notice of regular practitioners—a sort of neutral-ground between them and the professed charlatan, affording to the latter, however, handsome returns. It is only within the last sixty years that due consideration has been paid to this important organ, on the integrity of which so much happiness or misery depends; and the period is still shorter in which its pathology has been investigated, and its diseases studied in a proper philosophical spirit. But this has been done; and now, surveyed by the light of modern science, the diseases of the eye no longer present that obscure aspect which deterred former practitioners from undertaking their management, nor is it thought derogatory to men of the highest education and professional acquirements to devote themselves to their relief. We propose to consider the means by which this change has been wrought.

Until 1804 there was not a single institution in this country specially devoted to the treatment of ophthalmic disease; nor were there any lectures on the subject delivered prior to 1817. A few operations might be demonstrated, and a few of the leading diseases mentioned, in the courses of general surgery; but neither the student nor the public in those days considered that a knowledge of these complaints formed part of the education of a surgeon. In 1804, however, two eye infirmaries were established in London. In that year the scourge of purulent ophthalmia, imported from Egypt by the troops which formed the expedition under Abercrombie, swept through the British army, and so deplorable were the effects, that general attention was excited. Mr. Wathen, afterwards Sir Wathen Waller, an oculist of eminence, availed himself of the opportunity to bring before George the Third the desirableness of establishing an infirmary for eye diseases exclusively; and it appears that "their Majesties and the Royal Family graciously and humanely approved the plan, and honoured it with their patronage and benefactions." Such was the origin of the

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* We have only received this first number of an English ophthalmological journal in time to insert it among the titles of books at the head of this article. We welcome its appearance as a further sign of the advance of the science and art of ophthalmology.

Royal Infirmary for Diseases of the Eye, in Cork Street, which commenced under Mr. Wathen, and has remained for many years under the sole charge of Mr. Alexander. Commenced under more modest auspices, but leading to far greater results, was the London Dispensary for curing Diseases of the Eye and Ear, now the Royal London Ophthalmic Hospital, Moorfields, originated by Mr. John Cunningham Saunders and Dr. Farre, and opened for the reception of patients on the 25th March, 1805.

It seldom falls to the lot of a man to see a science created and brought to a high degree of perfection during his lifetime. But we are happy to say that Dr. Farre still lives—the Nestor of ophthalmologists, who has seen prejudices overcome, difficulties surmounted, and now beholds the institution he assisted in establishing, and the science which has been created, as it were, under his eye, flourishing and fructifying to an extent which might satisfy the expectations of the most sanguine.

This gratification was withheld from his friend and coadjutor: smitten with amaurosis, and tormented with a train of distressing symptoms, the valuable life of Mr. Saunders was closed, by cerebral disease, in 1810.

It is impossible to estimate too highly the beneficial influence which has flowed from the introduction into the original laws of Moorfields Hospital of a clause rendering it imperative that the medical officers of the institution should be regularly educated physicians or surgeons. It was this politic law which secured for it the services of Travers, Lawrence, Tyrrell, Scott, Macmurdo, and Dalrymple, worthy predecessors of the present numerous and able staff; and with such advantages, it is not to be wondered at that students flocked to it for instruction, of whom many are at present the ornaments of ophthalmic science at home and abroad. Amongst the earliest students were Mr. Stevenson and Sir William Adams; the latter founded the Eye Infirmary at Exeter on the model of Moorfields, but did *not* reciprocate the liberality of feeling displayed towards him by Mr. Saunders.

It was not, however, until after the lapse of six years from its commencement, that the Eye Infirmary at Moorfields was made specially available as a means of instruction. We have reason to suppose that the suggestion then emanated from Mr. Travers, in whose preface to his "Synopsis of the Diseases of the Eye," the following passage occurs:—

> "In this country I believe no one before myself, who designed to practise general surgery, ventured to give more than a cursory attention to the diseases of the eye. A fear of being disqualified in public opinion by a reputation acquired in these, for the treatment of other diseases, was a motive, however groundless, sufficient to deter surgeons from the cultivation of a large and legitimate field of observation and practice. . . . . I accepted the situation of Surgeon to the Eye Infirmary in the year 1810. . . . . At the commencement of the following year, the students of surgery were first invited to attend the practice of the infirmary—an opportunity eagerly embraced, and which many hundreds have since enjoyed."

Mr. Lawrence was elected Surgeon to the Eye Infirmary in 1814, and Mr. Tyrrell became attached to the institution shortly afterwards. Nevertheless, nearly four years elapsed before a systematic course of lectures on the eye was delivered in London. After the conclusion of the war, Mr. Guthrie, who had seen the sad deficiency of the physicians and surgeons of the army and navy in respect of eye diseases, joined with Dr. Forbes in establishing the Royal Westminster Infirmary for Diseases of the Eye, in Marylebone-street, Piccadilly, and soon afterwards commenced lectures on the Anatomy and Diseases of the Eye. Almost simultaneously (in fact, we are not sure which had the priority) a full systematic course of lectures on the eye originated with a Professor whose name is so identified with Glasgow, of which University he has long been one of the brightest ornaments, that few are now aware that he, *William Mackenzie*, was ever a lecturer in London.

In 1818, Dr. Mackenzie, then practising in Newman-street, Oxford-street, delivered a systematic course "On the Diseases and Operative Surgery of the Eye." He had recently returned from visiting the schools and hospitals of France, Italy, and Germany; and in his introductory lecture said, "Above all, I shall endeavour to render justice to doctrines and operations in which I had the happiness to be particularly instructed by Professor Beer, during my residence in Vienna." In those days the opportunities for Continental instruction were available to few English practitioners, whilst the Viennese Ophthalmic School stood pre-eminent; so that the advantages enjoyed by Dr. Mackenzie, as a pupil of the celebrated Beer, were really great. There were but two courses delivered by Dr. Mackenzie in London, for in 1820 he removed to Glasgow, being invited to fill the anatomical chair in the Andersonian University. Here he gave an annual course on the eye, till 1828, when the University of Glasgow, having resolved to found a lectureship on ophthalmic science, Dr. Mackenzie was translated to that chair; and, as Professor of Ophthalmology, continued to deliver a course of about sixty lectures every winter until the last two sessions, when we regret to say the state of his health obliged him to transfer the reading of his lectures to his able former pupil and present colleague, Dr. William Brown. In 1824, Dr. Mackenzie established an Eye Infirmary in Glasgow, which met with deserved success; and he has held the office of surgeon to that institution, gratuitously, up to the present time.

From London there flowed to the provinces a stream of men who had studied under the eminent professors whose names we have mentioned, and in each large town there arose an infirmary or dispensary for the relief of diseases of the eye. Need we more than mention the names of Dr. Butter, of Plymouth; Mr. Barnes, of Exeter; Mr. Middleman, of Birmingham; Mr. Wilson, of Manchester; Mr. Estlin, of Bristol, as proofs of the fame acquired, and justly acquired, in these provincial institutions? Whilst at the parent source there emanated the various works from the pens of Mr. Lawrence, Mr. Travers, Mr. Guthrie, Mr. Tyrrell, and Dr. Mackenzie, which have earned for their authors a world-wide reputation.*

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* Dr. Mackenzie's Practical Treatise on the Diseases of the Eye has reached its fourth

The surgeon whose influence is most marked in the ophthalmic practice of the present day was the late Frederick Tyrrell: previous to his time the bleeding system was in full force; the fear of inflammation haunted operators like a phantom, and the lancet was ever in the hand, not to arrest inflammation, but to anticipate the possibility of its occurrence.* Mr. Tyrrell shrewdly doubted the propriety or necessity of such wholesale depletion, and his practice taught the pupils that a widely different plan might be followed with the greatest advantage. His views were published in 1840, in his practical work 'On Diseases of the Eye,' and their soundness has been proved by their general adoption.

The abuse of depletion was only one of many points on which Mr. Tyrrell laid great stress. He pointed out to his pupils the principles which should guide them in their management of ophthalmic diseases, especially that very numerous class depending on an asthenic condition of the system. He deprecated the use of strong irritating applications to the eyes, and taught us to rely rather on general measures than on topical remedies; and no man was more happy in hitting off the precise line of treatment adapted to the requirements of each case. In one point, however, experience has led us to differ with him —namely, the expediency of opening the eye on the third day after extraction; we are convinced that this is at least forty-eight hours too soon, and that the fifth day is the earliest on which an examination should be made—supposing, of course, that no urgent cause presents itself for looking at the eye sooner.

An amount of interest attaches to men of eminence, and we will offer no apologies for presenting to our readers our personal recollections of Mr. Tyrrell. His appearance was prepossessing, his manner to his patients kind and reassuring, and his calmness was conspicuous in circumstances of difficulty. It is a singular fact, that when first attached to Moorfields, his ill success as an operator was so great that he was suspended from performing the major operations for above a year; yet by steady perseverance he acquired a dexterity with either hand that could not be surpassed. In extraction of cataract, his neatness was remarkable, and we well remember an instance of his coolness. The point of the section knife broke off, and dropped into the anterior chamber. Mr. Tyrrell withdrew the knife, and, without the least expression of impatience, asked for the blunt-pointed knife, with which he enlarged the section. He then removed the bit of steel, and proceeded to extract the lens with such perfect *sang froid* that no one who had not seen the breaking of the knife would have known that anything untoward had occurred.

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edition, and has been translated into German, Italian, and twice into French; it has also been reprinted in America. Mr. Lawrence's Treatise on the Diseases of the Eye has been translated into several foreign languages, and there is an American edition by Dr. Hayes.

* See Lawrence On the Diseases of the Eye, first edition, p. 427; also Astley Cooper's Lectures, fourth edition, 1835, p. 286. Mr. Saunders used the lancet freely; he took thirty-five ounces of blood from a girl of thirteen, on whom he had operated for cataract, and a hundred and seven ounces from a man under similar circumstances. The cases are mentioned in his work.

Another time, when performing extraction, the iris proved so rigid and unyielding, that the lens, instead of passing through the pupil, slipped out of the capsule, and passed downwards and backwards into the vitreous humour. Mr. Tyrrell made no further attempt to remove it, but quietly remarked that the operation had been unexpectedly converted into one of depression, and that he dared to say the patient would do very well; which was the case.

Mr. Tyrrell's great success depended fully as much on his judicious after-treatment as on his manual dexterity; and his secret lay in not exhausting the systems of his patients unnecessarily, but keeping the balance of power precisely at healing point. His views have been adopted by some of the most successful practitioners of the present day, many of whom were his pupils.

On a hot day in May, 1843, whilst an active competition for a house was going on at the Auction Mart, an alarm was raised that a gentleman had fainted. He was carried out, alas! dead! It was Frederick Tyrrell, who had attended the sale for the purpose of purchasing the very lot then under competition, which, indeed, was the house he occupied. His heart was diseased, and thus he died!

A colleague of Frederick Tyrrell's at Moorfields was John Scott, who presented as great a contrast to the former as could well be imagined. Impatient and irritable in manner, he could not bear anything to go wrong; no man lost vitreous humour more frequently during extraction, at which he was invariably annoyed, ascribing it, however, to "fluidity" of that body. His ideas, also, as to the cause of non-success in extraction were peculiar. He referred it to inflammation of the iris, the result of its compression between the lens and the flat blade of the knife during the performance of the section.* He therefore invented a narrow sickle-shaped knife to obviate this, and described it in the work just mentioned. With the exception of Mr. Dalrymple, we do not remember any operator who adopted this instrument, which is now almost forgotten; and are quite sure that no greater success was found to attend its use than that of the discarded knife of Beer.

Mr. Scott died early; and after his decease, and that of Mr. Tyrrell, John Dalrymple, whose star had been for some time in the ascendant, moved into the first position. A combination of favourable circumstances led to this. John Scott had contemplated the publication of a volume on the Pathology of the Eye, and had at considerable expense acquired a choice collection of water-colour drawings, intended as illustrations; but finding that his rapidly failing health precluded the possibility of his plans being carried out, he bequeathed his drawings to Mr. Dalrymple.

The publication of the volume was entrusted to Mr. Churchill, and every advantage that fine paper and artistic skill could afford was supplied; the drawings, on stone, were executed by Mr. W. Bagg, and were coloured by Mr. Sherwin, the printing being beautifully executed by Messrs. Hullmandel. The appearance of each fasciculus increased the reputation and the practice of Mr. Dalrymple, but by a sort of fatality attending this work, he died within a few weeks after its completion, in the zenith of fame and full tide of prosperity.

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* Cataract and its Treatment. By John Scott. London, 1843.

The cost of 'The Pathology of the Eye,' was nearly fifteen hundred pounds; and we are informed on very good authority that very few copies remain in this country, the great proportion having found their way to Germany and the United States.

The superior style and execution of this book formed an era in ophthalmic bibliography. The illustrations which had previously appeared in British works on the eye had, with few exceptions, been of a very inferior order, calculated rather to mislead than to instruct; but since its publication a marked improvement has been visible in this respect, though we may mention *en passant*, that for rigid accuracy and stern disregard of artistic embellishment, we know of no work comparable with M. Sichel's 'Iconographie Ophthalmologique,' of which eighteen livraisons have appeared.

Absolute fidelity is all-important in illustrations of eye disease: slight differences of tint, peculiar shades of colour, the course and arrangement of bloodvessels, mark the distinctions between grave maladies; and unless these points are accurately rendered by the artist, the plate not only fails to convey instruction, but may actually mislead. It may be difficult to obtain a sight of Mr. Dalrymple's work, but we would particularly recommend students to familiarize themselves, if possible, with M. Sichel's plates as, they will obtain from them truly valuable information.*

The Introductory Discourse prefixed to the 'Outlines of Ophthalmology' heading this article, was that delivered by Dr. Mackenzie as his inaugural lecture in 1828, and is marked by the sound sense which characterizes all his writings: the views which he enunciates as to the importance of ophthalmic studies, and the mode in which those studies can be most profitably pursued, are as appropriate at the present day as they were thirty years ago. The 'Outlines' themselves are the synopsis of the course of lectures of which it gives the subject matter, showing that there is no point overlooked, and nothing left unexplained.

The materials for the lectures are for the most part to be found in an expanded form in Dr. Mackenzie's 'Physiology of Vision,'† and in his well-known 'Practical Treatise on the Diseases of the Eye.'‡ The first of these works affords all the information known on the subject of which it treats up to the date of publication; of the second work, little need here be said, save that it is the most comprehensive work of its kind in the English language, and is a safe guide to the practitioner.

The work of Mr. Wharton Jones is of a different description; it is in the form of question and answer, and has been drawn up with the desire of aiding the student in his clinical observations at the hospital.

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* Iconographie Ophthalmologique; ou, Description, avec Figures colorée, des Maladies de l'Organe de la Vue. Par J. Sichel. Paris.

† The Physiology of Vision. By William Mackenzie, M.D. London, 1841.

‡ A Practical Treatise on the Diseases of the Eye. Fourth edition. London, 1854.

The title of the volume by Dr. Spencer Thomson indicates that it is on the model of the Bridgewater Treatises; it is carefully executed, profusely illustrated, and agreeably written. The concluding chapter, On the Philosophy of Vision, is an excellent *résumé* of the bearings ot the whole subject as illustrative of the beneficence of God.

A work which has raised the reputation of the British School, is the admirable treatise on Colour Blindness,* by Dr. George Wilson, ot Edinburgh; for acuteness and research it deserves the highest praise, and though this difficult subject has been investigated by several able Continental ophthalmologists, Dr. Wilson has surpassed them all. In the course of his extensive and methodic inquiries, the Doctor discovered many new facts; but as we have already laid before our readers a summary of his observations, we need not now dwell upon them.

The discovery of a means of examining the deep tunics of the eye, possesses an importance which cannot be overrated; but this very importance has led to rather too great a tendeucy on the part of Continental ophthalmologists to appropriate all the credit which attaches to the discovery. Nevertheless, it is but an act of justice to our countryman to state that it was Mr. Cumming who, eleven years ago, pointed out the existence of a reflection from the back of the human eye, and distinctly recognised the significance of the discovery. In the twenty-ninth volume of the 'Medico-Chirurgical Transactions' (1846) will be found a paper, by Mr. William Cumming, "On the Luminous Appearance of the Human Eye," which contains the following passage:—

> "The establishment of the fact of a similar reflection from the healthy human eye to that from the eyes of animals, appears to me chiefly important in its adaptation as a mode of examining the posterior part of the eye. The retina and choroid hitherto concealed in the living eye, and little opportunity being afforded of examining their condition after life, in consequence of their diseases not terminating fatally, considerable uncertainty has hitherto attended the diseases ascribed to these structures; but the existence of this luminosity, its non-existence or abnormal appearance, may enable us to detect changes in these structures heretofore unknown, or satisfactorily to see those which we only suspected. If we dilate the pupil by atropine, we have a means afforded of seeing the condition of the retina and choroid in every case. The cases I have examined in this way have confirmed the general impression that the retina is not frequently the seat of change in amaurosis; for out of several cases of amaurosis, in which the non-opacity of the cornea, lens, and humours allowed this mode of examination, I found but two in which the retina was so changed that the reflection was not seen.† (p. 290.)

It is not our intention to enter into any detailed account of the ophthalmoscope, but we would advise the younger members of the profession to acquire a practical acquaintance with it, for undoubtedly it is of great value; nevertheless, we would put them on their guard against its indiscriminate use. It is not safe to throw a flood of light into an eye in which the retina is the seat of inflammatory action, nor even of congestion, nor is it prudent to prolong an examination if the patient finds it distressing. Ascertain as quickly as is consistent with the object, the condition of the deeper tissues, but do not let the gratification of mere curiosity tempt you to risk the eye. We are aware that some are of opinion that harm never results from ophthalmoscopic examination; but we have had proofs to the contrary.

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* Researches on Colour Blindness. Edinburgh, 1855. See also British and Foreign Medico-Chirurgical Review, vol. xviii. p. 56.

† Brücke, Professor of Physiology at Vienna, observed and investigated the luminous appearance of the eye, in 1847. Helmholtz, of Königsberg, invented the ophthalmoscope itself in 1851. Since that time, Ruete, Jäger, Coccius, Anagnostakis, and others have invented or modified instruments of this description.

There are two points which appear to us eminently characteristic of British practitioners. The first is, the earnestness with which they do their best to *cure* their patients. This proposition may be startling, for do not *all* practitioners endeavour to attain this object? Scarcely; some, and men of eminence too, might be named with whom the brilliant performance of operations was the chief aim and object, and who cared very little about the patients afterwards, neglecting as beneath their notice that important element of success, the after-treatment.*

The other point is, the straightforward practical character of our treatment. Englishmen are less given to theorizing, and more to unprejudiced observation, than their brethren on the Continent, and we bring this characteristic to bear in the management of disease. Our notions are less fanciful than theirs: for instance, no Englishman of mark would have suggested as a preparation for extraction, the dropping into the eye a stimulating application—for what? *to accustom it to the contact of a foreign body!*† Yet this was gravely proposed abroad; indeed, the volumes of the 'Annales d'Oculistique' are rich in examples of this peculiar play of fancy. We say, then, that it is by earnestness in our object—that object being less the glorification of ourselves than the good of our patients, and the natural result of this, the treatment which best attains our end—that success attends our practice. We are perfectly aware that much prejudice exists on the Continent with reference to our treatment; but it is founded on the same ignorance as that which makes all Englishmen drinkers of spirits, and habituated from early youth to a light calomel diet. An acquaintance of ours had occasion to consult a foreign professor, and had not proceeded far with his tale of woe, when he was cut short with "Ah! I see! You take calomel! You drink spirits! All English take too much!" "'Pon my conscience," replied the patient, "I neither do one nor the other; and I would have you to know that I am *not* English! I am a Welshman." "Ah! truly! that's quite another matter; but a thousand pardons! I really took you for an Englishman," apologized the mystified professor, who forthwith entered on the case with zeal.

The tendency of the present age undoubtedly leans to subdivision of labour; or, in other words, to men possessing the advantages of a thorough acquaintance with the principles of their profession, devoting themselves especially to a limited description of practice. There is a wide distinction between the ophthalmic surgeon of the present day and the oculist of the last century. The one, highly educated, well-informed in his profession, and able to bring to bear all the discoveries and appliances of modern science; the other, too often a mere operator, ignorant of everything but eye diseases, and having but a limited acquaintance even with them.

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* It is stated on good authority that *one-half* of Roux's extractions failed of success, though performed in first-rate style. The cause of the ill-success was that mentioned above.

† "Avant d'opérer une cataracte, M. Jobert fait mettre matin et soir quelques gouttes de teinture thébaïque dans l'œil, pour habituer cet organe au contact des corps étrangers!" Annales d'Oculistique, t. xxix. p. 65.

One of the effects of the modern system will doubtless be to mark more strongly the limits of each department. Writers on the Practice of Physic, for instance, will be relieved from the necessity of including among their subjects gonorrhœal ophthalmia and iritis, and as every sheet that increases the bulk of a volume enhances the cost, the purchaser will be a gainer as well as the author.

There are at present in London eight institutions specially devoted to the eye: they are, the Royal London Ophthalmic Hospital, Royal Westminster Ophthalmic Hospital, Royal Infirmary for Diseases of the Eye, North London Infirmary for Diseases of the Eye, Central London Ophthalmic Hospital, Western Dispensary for Diseases of the Eye, West London and Chelsea Infirmary for Diseases of the Eye, and the St. Marylebone Eye and Ear Institution. Besides these, three hospitals have special ophthalmic departments—namely, Guy's, under Mr. France; St. Mary's, Mr. White Cooper; University College Hospital, Mr. Wharton Jones; and at most of the other hospitals, eye cases are seen by one of the medical officers apart from the general patients.

It is to be regretted, however, that the examining corporations have been behind all others in acknowledging the importance of a thorough knowledge of eye diseases. It is scarcely credible, though perhaps characteristic, that at the present moment neither the College of Physicians, the College of Surgeons, nor the Society of Apothecaries require distinct proofs of a competent knowledge of these diseases, such as can only be acquired by studying them practically; nor is attendance on lectures on ophthalmic medicine and surgery compulsory. Questions may now and then be asked at the college concerning the anatomy and the most prominent diseases of the eye, but there is nothing to lead the student to familiarize himself with the nice pathological distinctions which mark its maladies beyond all other organs; nor to encourage him to acquire such a thorough knowledge of their treatment as will enable him in after life to combat them with confidence and success. Attempts have repeatedly been made to establish in London classes for ophthalmic instruction after the Viennese method, but they have never met with encouragement, and each sanguine teacher has in turn abandoned the vain effort. This no doubt is the reason why Moorfields, with its thousands of patients and all its other advantages for instruction, has not delivered within its walls such a course of lectures as is offered by Dr. Mackenzie at Glasgow.

In favourable contrast to the apathy of the London Examining Boards on the subject of diseases of the eye, stands the Calcutta

Medical College, which lays great stress on this subject. The East India Company wisely established an eye infirmary at each of their Presidencies, not merely for the benefit of their servants and of the natives, but as a means of affording instruction to their medical officers; and we have heard striking illustrations of the value of this knowledge in restoring vision, a sense prized by the natives of India beyond all others.

Provision, then, is made in the Calcutta Eye Infirmary (the chief of these establishments) for a full course of instruction in ophthalmic medicine and surgery, and attendance is made compulsory. The class consists of the most advanced students of the English department of the Medical College; each in turn acting as clinical clerk or dresser, and having special charge of cases in the wards and among the out-patients. At the conclusion of the fifth year of study, the students pass an examination for their final diploma, and ophthalmic surgery is one of the subjects in which they are specially examined. The examination is conducted by the professor (who is the superintending surgeon), in the presence of a Government examiner and assessors; and besides being expected to display a full knowledge of the subject theoretically, their practical acquaintance with it is tested by their being required to describe the diseases with the appropriate treatment, of patients selected for that purpose. The plan of instruction was, we believe, first laid down by the late Dr. Bedford, but was greatly enlarged and amended by Dr. William Martin, who has filled for many years the responsible post of superintending surgeon, and to whose industry and skill we are indebted for the valuable statistical information contained in the "Report" heading this article, from which we proceed to glean some useful facts.

It appears that among the natives of India hard cataract is a rare disease; of 586 cases of cataract recorded by Dr. Martin, there were—

Of hard cataract	25
Of soft "	116
Of fluid "	24
Of mixed "	372
Of capsular	49

The description called "mixed," which forms so large a proportion of the whole, is thus defined :—

> "By mixed consistence, I mean to designate those which are as far removed from the small hard cataract as the soft or fluid, which had not sufficient density to become depressed; it is more nearly that of a firm gelatinous substance than anything I can describe." (p. 7.)

This being the case, the needle is far more generally used than the extraction knife; indeed, the extractions formed only two per cent. of the whole of the operations. With reference to this point, the following observations are peculiarly interesting, inasmuch as extraction is so greatly and so properly preferred in this country:—

> "As extraction is no doubt in itself the most perfect operation for removal of the opaque lens, I have been induced to practise it but in only about two per cent. of the whole number of cases. A few successful operations induced

me to try it a little more extensively than I otherwise should, for my predecessors in the charge of the Eye Infirmary were not in the habit of performing it; but the success, upon the whole, has been so small, that I have since abandoned its use, except in peculiarly favourable cases. I have found, however, as the occasional result, that the sight has been restored to a greater extent after extraction than after any other operation; and I have had some peculiarly fortunate cases as double extractions successful, and with extraction in one eye, and depression or other operation in the other eye, the sight of the extraction eye has been decidedly better than the sight of the other, although the other operation has been of the most successful kind in its way.

"The result of my experience during the four years reported upon, and the succeeding years, has impressed me with the conviction that extraction is not an operation generally suited to the Bengalee. The causes are to be found partly in his physical conformation rendering the operation in its perfect form very difficult. The chief of these are his prominent brow, small sunken eye with a proportionably large lens, and partly in his comparatively feeble constitution, which renders union of the section made in the cornea uncertain and rare, compared with the same in the European patient." (p. 11.)

The Hindoos themselves operate for cataract, and, on the whole, with considerable success. Their mode of proceeding is so curious that we shall give an account of it, condensed from a detailed report by an assistant-surgeon in the Bengal service. The patient was an old woman, who had already successfully undergone the operation on the left eye at the hands of the native who was now about to operate on her right eye; his instruments consisted of a lancet and a brass probe, with a blunt triangular point and narrow neck; the operator commenced by wrapping a thread round the blade of his lancet to within an eighth of an inch of the point, and the probe was similarly guarded. This part of the business was done with many gesticulations, and was evidently regarded as of importance.

The patient was now seated on the ground, and the operator placed himself immediately in front of her, making her grasp his girdle with both hands; the surgeon who describes the scene supported her head from behind. The operator then opened and fixed the eyelids with the fingers of his right hand, and desired the patient to look inwards; on her doing so, he thrust the lancet into the eye about a line beyond the cornea, and on its penetrating to the depth allowed by the thread, withdrew it, and closed the lids. In the course of a few seconds the eye was again opened, and he proceeded to use the brass probe, which he introduced into the wound with a boring motion. When it had fairly entered the eye, he turned the thick end of the probe downwards, and elevated the point until it touched and raised the junction of the cornea and sclerotic. A small dossil of lint was now placed between the handle-end of the probe and the cheek on which the probe rested, the eyelids were closed, and the probe left in this manner in the eye! A ball of lighted charcoal was now brought, and the lids being opened it was applied pretty close to the eye for a few seconds. This being removed, the operator took the probe in his left hand: withdrawing it a little from the eye and elevating the handle, he began to press the triangular point upon the upper and back part of the lens in order to depress it; failing to accomplish this, the dossil of lint was again introduced under the handle, the lids closed, and the probe left suspended in the eye; a second attempt was then made, still without success; again all things were put in the same order, the charcoal re-applied, and then a third attempt at depression was made. This time the lens yielded, and was slowly and steadily pushed to the very bottom of the eye, where for a few seconds it was kept, the probe still resting upon it; at this juncture the operator questioned the patient as to whether she had recovered her sight, and desired her to count his fingers, which she did with facility, and also discriminated other objects, the probe still remaining in the middle of the eye! The instrument was now gradually raised, and gently withdrawn in the direction in which it had been introduced. The eye was then moistened with a wet cloth, and both operator and patient said it would be quite well in a few days. It was not even thought necessary to desire the patient to remain still, and she was left walking about the verandah. We must now leave Hindoo surgery, and return to the more refined proceedings of civilized art.

The plan adopted by Dr. Martin in the treatment of staphyloma is but little practised in this country, from the fear chiefly that the retaining a ligature in the eye would cause intolerable suffering and furious inflammation; nevertheless, he tried the ligature in six cases with happy effect. Dr. Martin thus describes his method of proceeding:—

> "A curved needle armed with a ligature is passed through the base of the tumour, the closed end of the ligature divided, and one part passed above, the other below the tumour, and secured as near as possible to the junction of the tumour with the remains of the cornea, or the substance of the globe. This possesses the great advantage over excision that it does not cause any large portion of the humours of the eye to be evacuated. With excision, it is not always, certainly, but often impossible to avoid the escape of a large portion of them; consequently the globe collapses to such an extent that it exerts no support on the lids, which fall in, and the remains of the globe form an unsightly object. This is altogether avoided in successful cases of ligature, which causes sloughing off of the tumour, but leaves the globe nearly as full and prominent as in the natural state. . . . . I have not found the irritation caused by the double ligature intractable, and look upon it as by far the most suitable operation for the greater number of cases of troublesome staphyloma." (p. 20.)

The blind are a very numerous class in China, partly from the effects of small-pox and ophthalmia, and partly from the irritation excited in the eyes and eyelids by the proceedings of the barbers, who consider it part of their duty not only to shave the head and face, but to fret and irritate the eyelids, whereby entropium is frequently produced: the missionaries who have proceeded to that country very wisely studied medicine and ophthalmic practice, and there are at least three hospitals where the poor are treated. An eyewitness has described to us the crowds who flock thither, and the respect and gratitude acquired by the medical gentlemen for the relief afforded, more especially from the sufferers from eye diseases. This gives them great influence with the natives, and may be productive of important results. One of the missionaries at Shanghae writes, "I think much good may be done among the blind; they seem more open to receive impressions of the truth than others; their affliction renders them thoughtful, and their willingness to be taught is remarkable."

Mr. Sirr adds his unbiassed testimony in these words:—

"We cannot conclude this chapter without stating that, in 1848, an hospital was established at Ning-po, by the missionaries, for the cure of ophthalmia, from which the natives of China suffer most severely, being peculiarly liable to diseases of the eyelids; the numbers which apply for and receive relief are considerable, and hundreds are benefited in the course of the year by this institution, worthy of a Christian country."* (vol. ii. p. 207.)

When we look back on the labours of Wardrop, Saunders, Travers, Mackenzie, Jacob, Lawrence, Guthrie, Tyrrell, Middlemore, and Dalrymple, and when we see the acknowledged respect with which their names, and the names of others who are following in their steps, are received at home and abroad, we cannot but feel that Britain has contributed at least her share to the common fund of ophthalmic knowledge. Beginning late in the day and having to contend with many difficulties, she has nevertheless maintained an honourable position in the race for distinction; and we may well be proud of the reflection, that to the far East, not less than in the West, her sons have carried with them the noble art of healing; and that their names are ever mentioned with respect for philanthropy not less than for skill.

This article has reached its limit, and we shall close it with two remarks addressed to those whose career is but commencing. We have shown that ophthalmic practice has been raised from a state of comparative degradation to a high position. One circumstance which has mainly contributed thereto has been the reputation for principle and honour which characterized, amongst others, Saunders, and Tyrrell, and Dalrymple, whose respective careers of usefulness but too soon closed. Take your tone from them; and ever remember that each man is responsible to the profession and to himself for maintaining inviolate the dignity of his calling.

Lastly: Be considerate to the feelings of the blind; these poor dwellers in the land of darkness have need in their misfortune of our sympathy and kindness; none are more open to a word spoken in season; and it is the privilege of a physician to suggest to the anguished heart that consolation may be found by looking to that glorious land where darkness is no more, and where the poor crushed spirit, having dropped the mantle of mortality, may hope to stand arrayed in a robe of light.

REVIEW VII.

Mémoires de l'Académie de Médecine. Tome XX. pp. ccxl., 556.
4to.—*Paris*, 1856.

THE present volume of the French *Mémoires* does not call for a very lengthened notice; and we need only enumerate the titles of the papers that constitute the first of the two portions into which it is divided. These are (1) Documents illustrative of the History of the Royal Academy of Surgery; (2) A Funeral Oration on M. Magendie, and an Éloge on M. Récamier, both by the Secretary, M. F. Dubois; (3) A Biographical Sketch of M. Ernest Cloquet, by M. Larrey; and (4) Reports on the Distribution of the Academical Prizes on the Public Administration of the French Mineral Waters during 1853, and on the Epidemics that prevailed in France during 1854.

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* China and the Chinese. By Henry Charles Sirr, M.A. London, 1849.

I. The first paper in the second part is a prize essay entitled, *Puerperal Albuminuria, and its Relations to Eclampsia.* By D. A. Imbert-Gourbeyre.

After an historical retrospect, in which the author exhibits a better appreciation of foreign medical literature than is usual amongst his countrymen, he goes on to state that his object is to show that puerperal albuminuria is neither more nor less than Bright's disease (improperly called albuminous nephritis), there being a puerperal Bright's disease just as much as there is a puerperal pneumonia or peritonitis. Moreover, puerperal eclampsia is nothing else than puerperal Bright's disease in which convulsions occur; or, in other words, the eclampsia is really sympathetic of Bright's disease.

1. *Symptoms.*—He enters into these in some detail, because Cazeaux and others have denied that the albuminuria met with in pregnancy gives rise to symptoms that are observed when it is due to disease of the kidney; and because he believes that his own researches have on several points added completeness to the symptomatology of Bright's disease. (1.) *Defective vision, or albuminous amaurosis.* This symptom of Bright's disease was first prominently brought into notice by Landouzy, although previously noticed by other observers. Some have since failed to remark it; but from among 25 cases of Bright's disease that have occurred to the author, he has observed it in 21 or 22; and of the 12 cases of puerperal albuminuria reported in the present essay, it was observed carefully in 3. (2.) *Cephalalgia,* which is a notable symptom in ordinary albuminuria, was observed markedly in 4 out of the 12 cases. (3.) *Local pains,* especially pleurodynia, of frequent occurrence in Bright's disease, were well marked in 2 cases. (4.) Facts on record show that there is an *albuminuric paralysis,* and this seems to be of more frequent occurrence in the puerperal state, appearing either as prodromic or consecutive to the eclampsia. (5.) *Contractions,* strictly analogous to the idiopathic contractions or muscular spasms described by Delpech and others, have been observed by the author in several cases of Bright's disease, although the symptom has been passed over in silence by other authors. In the present paper he gives a detailed account of them as they appeared in a case of puerperal albuminuria. Delpech, indeed, had stated that the puerperal state predisposed to contractions of the extremities, and relates 18 cases in proof. In only one of these the urine was examined, and it was found to be albuminous. (6.) *Hæmorrhage* is another symptom that is sometimes met with in Bright's disease, and yet has been almost entirely passed over. The

author has met with it in the form of epistaxis, of gingival bleeding, hæmatemesis, and external or internal ecchymosis; and he has seen it oftener in puerperal albuminuria than in ordinary Bright's disease. (7.) *Expiration of ammonia.* The limited observations that the author has made do not confirm the statement of Frerichs as to the presence of ammonia in the expired air. (8.) *Hardness of pulse.* This is remarkable. (9.) *Gastric derangements*, as nausea, vomiting, &c., frequently met with by the author and other observers in Bright's disease, occur also in puerperal albuminuria. He suspects that some of the obstinate cases of vomiting in pregnancy are due to a latent albuminuria. (10.) *State of the urine.* Alluding to the discrepancy of the statements of writers as to whether *frequency of emission* is a sign of Bright's disease, the author states that while it is not a constant one it is not void of importance, as it comes on early in the disease, and may draw attention to the condition of the urine. He observed it in three of the cases of puerperal albuminuria. In respect to the *colour and density of the urine*, he has found most albumen in urine that exhibited a normal colour, slight turbidity, and an oily appearance. He lays down in the aphoristic form the propositions he believes true concerning the *presence of albumen* in Bright's disease:—

"1. Although albuminuria is usually the first symptom of Bright's disease, it is not a constant one. 2. The quantity of albumen is exceedingly variable. 3. Albuminuria may appear from time to time, and be prodromic of anasarca. 4. It may appear and disappear at longer or shorter intervals (as every eight, ten, or fifteen days), and then coincide with the atrophic period of Bright's disease. 5. These variations of the albumen, then, bear a relation to the early stage of Bright's disease, especially when it is consecutive to another disease, as intermittent fever; as also to the advanced periods of the disease, when the kidneys have passed into a state of atrophy. 6. It is incorrect to say that transitory critical albuminuria may be distinguished from Bright's albuminuria, by the fact of its being neither constant or notable, as in the latter. The progress of the disease, and *concursus* of the symptoms, can alone clear up the diagnosis; for there are cases of Bright's disease, especially in the advanced period, when the albumen is neither constant or in notable quantity. 7. There are non-albuminuric anasarcas that are identical in their course and symptoms with anasarca accompanied by albuminuria. It is not at present possible to say why albuminuria should be present in the one case, and not in the other. 8. Anasarcas which are not primarily albuminuric may at a later period become so, the presence of albuminuria constituting the sole difference between the two periods." (p. 24.)

(11.) *Dropsical effusions.* The author thinks the facts relating to these may be thus summed up:—

"1. Two-thirds of the cases of Bright's disease are accompanied by œdema. 2. In a good third of them, or perhaps one-half, no œdema has existed. 3. In some cases the œdema is very slight. 4. In other cases there is no swelling until the terminal period. 5. In others, again, the dropsy is only internal, as hydrothorax, for example. 6. In other cases neither internal or external dropsy has existed. 7. Thus we may pay our homage to tradition, and apply to Bright's disease—a cachectic malady *par excellence*—the definition of cachexia given by Boerhaave, *marcor, vel leucophlegmatia et hydrops.* This is the history of Bright's disease." (p. 28.)

The signs and the course of albuminuric dropsies occurring during pregnancy are absolutely similar to those observed in Bright's disease. The facts as yet recorded seem to authorise M. Cazeaux's statement, that albuminuria very rarely exists in pregnant women without being accompanied by dropsy; but from what is known of the latent or cachectic form of Bright's disease, it is to be expected that more attentive observation will lead to the establishment of more numerous exceptions.

(12.) *Condition of the blood.* From all that has appeared upon the subject, it may be stated—1. The fibrine is in normal condition, increasing only accidentally, as *e.g.* from intercurrent phlegmasiæ. 2. Generally there is a notable diminution of albumen. 3. Progressive diminution of globules. 4. A slight diminution of soluble salts, and a more or less considerable accumulation of the excrementitial parts of the urine. The same results have been observed in puerperal albuminuria. The diminution of the albumen of the blood is the dominant fact; but it has been shown, by the researches of Scanzoni and others, that even in the normal puerperal state the quantity of albumen is notably diminished, and is almost always below the mean amount—thus seeming to predispose the subjects to pathological disalbuminization of the blood.

(13.) M. Imbert-Gourbeyre is quite at issue with Frerichs and other German authors, who attempt to explain the cerebro-spinal complications so often met with in Bright's disease, by the theory of uræmic intoxication. He believes that this explanation rests upon no better foundation than does that which refers the symptoms to the disalbuminization of the blood—both being quite inefficient.

II. *Prognosis.*—When it has been sometimes stated that puerperal albuminuria does not excite a mischievous effect on pregnancy—seeing that in many cases the dropsy disappears rapidly after delivery, and the albuminuria ceases in from the fourth to the fifteenth day—its influence upon abortion and upon hæmorrhage, and its important relations to eclampsia, have been forgotten. But the author denies the accuracy of the statement that puerperal albuminuria generally terminates favourably upon delivery, and maintains that a greater number of cases persist in their course, and pass into a state of chronic and confirmed Bright's disease; and he believes that the more the facts are examined, the more positive will be the confirmation of the statement that, besides the deaths occurring during the puerperal state, a great number of cases of Bright's disease will be found to originate in the puerperal state. Of 164 cases that have been observed in modern times, he finds that there were 65 cases of puerperal albuminuria uncomplicated with eclampsia, 94 in which eclampsia existed, and 5 cases of eclampsia without albuminuria. Of the 65 cases, 21 died in the puerperal state, and 6 died in from three to fourteen months after delivery—i.e., 27 fatal cases out of 65 of puerperal albuminuria without eclampsia. If to these we add 5 cases of persistent Bright's disease, we have 32 deaths in 65 cases. Thus, a half of the women the subjects of puerperal albuminuria die, whether during the puerperal state (21 in 32), or at a more or less distant period from this (11 in 32). On the other hand, in one-half of the cases the albuminuria disappeared from the second to the fourteenth day after delivery, and in a sixth of the cases it persisted in the chronic stage. More attentive observation would raise the numbers still higher, for then cases of latent albuminuria, that now pass unperceived, might be detected; and intercurrent phlegmasiæ, which are so often met with in albuminuria, and which may be due to a latent form of it, might be taken into account.

III. *Pathological Anatomy.*—From among 32 cases of fatal puerperal albuminuria, there have been recorded by different authors accounts of 22 autopsies; and in 13 of these the lesions met with in Bright's disease were quite obvious, and in 9 they were dubious. In 5 of these last, the author does not himself regard the lesions as doubtful at all: but assuming that there were but the 13 cases, if we add to these the 5 cases of persistent Bright's disease mentioned before, and which always furnish such lesions, we have 18 out of 27 cases in which the signs of Bright's disease were obvious—a proportion quite large enough to justify the conclusion that a majority of cases of puerperal albuminuria are due to the existence of the lesions constituting Bright's disease. Without wishing to anticipate the question of the relation of eclampsia to puerperal albuminuria, the author adds the fact that almost the whole of the post-mortem examinations in eclampsia exhibit albuminous nephritis.

The author next refers to the two principal objections that have been urged against the identity of puerperal albuminuria and Bright's disease. 1st. If such identity prevails, how comes it that the puerperal albuminuria disappears so soon after delivery? It has already been shown that this is not always the case; for in a sixth of the cases observed it has persisted, and more attentive observation would increase this proportion. Moreover, one-half the cases have ended fatally. Do we not, too, see the dangerous vomiting, hæmoptysis, and acute affections of the chest, disappear upon the very fact of delivery occurring? and why should this acute form of Bright's disease not terminate favourably, just as the scarlatinal and other acute forms do? 2ndly. In a certain number of autopsies none of the ordinary lesions seen in Bright's disease have been met with. To this it may be replied that the figures are all in favour of the coincidence; while there is great disagreement among observers as to what constitute the essential lesions in Bright's disease.

IV. Before entering upon the question of the relations of eclampsia to puerperal albuminuria the author states his views upon a subject which he believes to be quite new—viz., *Bright's disease without albuminuria.* He observes that it is a matter of daily experience to find dropsies perfectly identical in all their features with each other, except in the fact of the existence of albuminuria. He gives some cases of these as an example, and especially refers to one of puerperal dropsy, in which, with a complete absence of albuminuria, lesions often met with in albuminuria were met with after death; and he quotes the statements of M. Mazonn, a Russian practitioner, that in cases of non-albuminuric dropsy a fatty state of the kidneys is frequently met with.

It is by the general *concursus* of symptoms, and viewing them in their totality, and not by the minute pursuit of a single symptom or lesion, that diseases are distinguished from each other.

> "These general considerations clear up a difficulty in the relations of eclampsia with puerperal albuminuria. Eclampsia is almost always accompanied with it; still, at the present time, it is incontestible that puerperal eclampsia may exist without albuminuria. Now, eclampsia, as we shall prove, being nothing else than puerperal Bright's disease complicated with convulsions, it is nowise surprising to meet with examples of it without albuminuria, seeing that cases of Bright's disease may exist without albuminuria. But how happens it that there are cases of Bright's disease without albuminuria? or, in other words, how comes it that the disalbuminization, which exists equally in Bright's disease properly so called as in the dropsies without albuminuria of Becquerel and Rodier—how comes it that this general pathological condition, which exhibits the same etiology, progress, and symptoms, should in one case be attended with albuminuria and not in the other? Here we are on *terra incognita:* and I may truly say that, in the actual state of science, we are completely ignorant of the intimate process through which albumen is present in the one case and absent in the other." (p. 52.)

The author believes that the explanation will be best discovered, not by confining our attention to the renal lesion, but by taking a more general view of the disease; inasmuch as the lesions may, in some cases, especially predominate in one organ, and, in other cases, in another.

v. *Relation of Eclampsia to Puerperal Albuminuria.*—Before speaking of such relation, the author thinks it necessary to state with precision what is to be understood by the term puerperal eclampsia. All puerperal convulsions are not eclampsia; and thus we must eliminate the hysterical form, which is not of unfrequent occurrence, especially during the early or nervous period of pregnancy, while true eclampsia very rarely occurs prior to the fourth month. In the same way must be abstracted cases of epilepsy, chorea, and catalepsy. Puerperal eclampsia is a special form of convulsions, well known to accoucheurs, and but of rare occurrence. Cazeaux found it occurring only seventy-nine times in 38,306 deliveries, and Braun fifty-two times in 24,000.

As proofs of the identity between eclampsia and Bright's disease, the author enumerates the following points:—1. There are always precursory symptoms in eclampsia, of which œdema is the most frequent and most remarkable. 2. Eclampsia is almost always accompanied by albuminuria. 3. There is a remarkable agreement as to termination and gravity between eclampsia and puerperal Bright's disease. 4. In ordinary Bright's disease there is eclampsia,* as well as in its puerperal form. 5. The same renal lesions are found after death in eclampsia and in Bright's disease. 6. In 41 cases of albuminuric women, Blot met with eclampsia only seven times; and in the same way, Bright's disease is only accompanied by convulsive affections in some cases. 7. Puerperal Bright's disease, as well as eclampsia, sometimes exists without the presence of œdema.

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* See some papers in the 'Moniteur des Hôpitaux,' 1857, Nos. 61–65, for an interesting account, by M. Leudet, of what is known upon the subject of convulsions in Bright's disease.

Dr. Gourbeyre notices also certain objections which have been made to this view of the identity of the affections. 1. As there may be undoubtedly eclampsia without albuminuria, what is then the relationship of eclampsia to Bright's disease? This fact is but confirmatory of the view stated, for even Bright's disease itself is sometimes non-albuminuric. 2. Eclampsia is sometimes suddenly developed, as a consequence of fear; how can it in such cases be regarded as symptomatic of Bright's disease? These cases are quite exceptional, and have been insufficiently observed. There may have been some precursory symptoms. 3. Eclampsia has also in some women appeared in successive pregnancies, and how is this to be reconciled with the theory of its being Bright's disease? These exceptional cases also require more accurate examination, and they may prove not to be cases of *true* eclampsia.

II. *The Influence of Sea-Voyages and of Hot Climates upon the Progress of Phthisis Pulmonalis.* By M. Jules Rochard.

This, like the last, is a prize essay; and the author, a surgeon of the French marine at Brest, drawing his conclusions from the experience he has had in the French navy, declares sea-voyages and warm climates exert an unfavourable influence upon the progress of the disease. From this experience, and from the examination of what others have written on the subject, he sums up as follows :—

"1. Sea-voyages much more frequently accelerate than retard the progress of pulmonary tuberculosis. 2. This disease, so far from being rare amongst sailors, is much more frequent among them than among land forces. It prevails with equal intensity in our port-hospitals, at our stations, and in our squadrons. The naval officers, the surgeons, the commissaries—all, in a word, who are engaged in the voyages—are subjected to this common law. 3. In spite of some rare exceptions, which must be admitted on the strength of certain facts reported by men well worthy of credit, the progress of phthisis is more rapid on board ship than on shore. 4. Naval professions should be most absolutely interdicted to young persons who seem threatened with phthisis, and for whom it has been the habit of advising their pursuit. 5. Tubercular patients can only reap advantage from sea-voyages by being placed on board under special hygienic conditions, and by changing the climate and locality according to season and atmospheric vicissitudes—things impossible of realization on board vessels having special duties to fulfil. Land journeys, and a prolonged residence in a well-chosen locality, allow of the same end being attained with less danger and at less cost. 6. Hot countries, considered in general, exert an unfavourable influence on the progress of phthisis, which they accelerate. 7. Those situated under the torrid zone (hot countries properly so called) especially possess this unfortunate prerogative, and residence in them should be formally prohibited to phthisical patients. The unanimous opinion of the chief surgeons in our own and in the English colonies, the comparative statistics of the colonial and European troops of England and France, the frequency of phthisis in our intertropical stations, and in the English stations situated in the same latitude, and a number of special observations, demonstrate this in the most positive manner. The examination of each locality in particular confirms the conclusion. 8. The greater number of the hot climates situated beyond the equatorial zone are equally prejudicial to tubercular patients. Certain points placed on the confines of this region, and limited to a very narrow space, are exceptions. That they are so is due to local conditions. Residence there better protects the phthisical from the acute affections of the respiratory organs which accelerate the progress of tuberculisation, allows of their leading a kind of life more calculated to maintain their strength, sometimes prolongs their existence, and always contributes to its easier termination. 9. It is during the first period of phthisis that emigration should be advised, and that we are justified in expecting good results from it." (p. 168.)

M. Rochard supports his views by various statistical statements, both French and English.

III. *On Cancroid of the Face, and the best Means of Treating it.* By Dr. Chapel.

In this paper the author endeavours to enforce the superiority of the operation by excision over that of cauterization, which, owing to its incompleteness, is more liable to be followed by relapse, and which when it does not effect a cure often only increases irritation. He insists also upon the performance of the operation at as early a period as possible; and in case of recurrence, or of the inguinal glands becoming implicated, attacking the new spot at once. Dr. Chapel relates ten cases of cancer of the upper lip or nose, in five of which caustics were employed, the patients eventually dying; while in the other five the knife was resorted to, the patients continuing well for periods varying from some months to some years. The nature of the disease in these last cases was verified by the examinations of M. Follin.

In relation to the causes of the affection, M. Chapel comments upon the greater frequency of its occurrence in men than in women, nine out of ten of these cases occurring in males. Most of these persons were regular smokers; and the author, who practises among the maritime population of St. Malo, attributes the occurrence of the disease, in many cases, to the habit of smoking *short* pipes, which are injurious not only form the injury they do to the teeth and lip, but also from the irritation induced by the great heat they give rise to. M. Begin, appointed by the Academy as reporter upon the paper, has also met with cases of this description; and he agrees with M. Chapel in thinking that the frequent use of short clay pipes is one of the most frequent and obvious causes of cancer of the lip.

IV. *On the Hepatitis of Hot Countries, and on Abscess of the Liver.* By M. Dutroulau.

M. Dutroulau, a naval medical officer stationed at Martinique, limits himself in this memoir to the consideration of acute hepatitis, and the suppuration which so often is a result of it. He furnishes a tabular view of the number of cases of disease observed at the Hospital St. Pierre, Martinique, during the five years 1846–51, specifying in particular the cases of dysentery and hepatitis. The total number of cases treated amounted to 7396, with 567 deaths, or 1 in 13. Of these, 3704 were cases of dysentery, with 347 deaths (1 in $10\frac{2}{3}$); and 339 cases of hepatitis, with 70 deaths (1 in $4\frac{1}{3}$). From this table he draws these conclusions:—

> "1. That the number of cases of hepatitis follows in exact parallel that of dysentery, whether this be ascending or descending. 2. That in the one, as in the other disease, there are periods of gravity that may be termed epidemic; and better periods, in which the number of patients and of deaths becomes lowered by more than two-thirds, as may be seen by comparing the years 1848 and 1851. 3. That dysentery and hepatitis together almost always constitute about one-half the total number of cases of internal disease treated at the Hospital of St. Pierre. 4. That during the period of severe endemics—as, for example, in 1848—the number of cases of hepatitis constitutes nearly $\frac{1}{8}$th of that of dysenterics, and more than $\frac{1}{14}$th of the entire number of diseases; while in mild periods, as in 1851, it constitutes but $\frac{1}{9}$th of the dysenterics, and $\frac{1}{23}$rd of the total number of cases. 5. That deaths from abscess of the liver are as 1 to $3\frac{2}{3}$rds as compared to those from dysentery in the same grave periods, and as about 1 to $5\frac{1}{2}$ in relation to the general mortality; while during the milder periods, they are as 1 to $4\frac{1}{2}$ of the dysenterics, and 1 to 7 of the total deaths." (p. 209.)

Thus it will be seen that the proportion of cases of hepatitis is very large compared with that met with in temperate climates; and it is, in fact, much greater than this table indicates, since cases only are mentioned in it in which the symptoms were severe enough to predominate over those of dysentery, while those cases are not indicated in which the hepatitis seemed a mere element of the dysenteric affection. In the hot climates in which such prevalence is observed there is also excessive humidity, great electrical tension, and great luxuriance of vegetable and insect life—the whole forming a vast laboratory for the production of miasmata. Thus the hepatitis must not be attributed alone to the high temperature, and to the action of this on the liver; for it is due to the various elements mentioned, and especially to the condition of the soil. Like dysentery, it is endemic at St. Pierre, and is of miasmatic origin. But the two diseases have other relations besides their common origin. Thus, in the great majority of cases they exist at the same time, whether the one or the other has first appeared; and it is very rare to meet with hepatitis that is not accompanied, or has not been preceded, by dysentery. The two diseases are alike liable to relapse, and after a certain time both assume the chronic form. Hepatitis puts on its severest aspect, and terminates in suppuration, just when the bad form of dysentery prevails endemically; and it is mild, and terminates by resolution, when the simplest form of dysentery is present. Acclimatization exerts no effect in either disease. The author doubts the soundness of the view which attributes the coexistence of the two maladies to the propagation, by means of venous inflammation, of disease from the intestinal mucous membrane to the liver. If this may seem sometimes to have been so, there are other cases in which neither intestinal ulceration or inflammation have existed. Most of the occasional causes are common to the two diseases; but there is one—viz., excessive bodily exertion—which seems especially to give rise to hepatitis. Thus the drummers, whose arms are in constant motion, furnish a larger proportion of cases than do the other soldiers.

Passing over the account of the *symptoms*, which is given with considerable exactitude, and the detail of six cases of abscess of the liver, we come to the section on the *pathological anatomy* of hepatitis attended with suppuration. The material for this is supplied by sixty-six autopsies, and the following particulars are deduced. The *seat* of the abscess may be multiple; and as there may be several abscesses in the same liver, the number of seats recorded is greater than that of the livers examined. Their disposition was as follows: first, as to *lobes*, the large lobe 62, middle 12, and the small 2; next, as to *surfaces*, 41 on the convex, and 9 on the concave; and as to *edges*, the proportion was as 13 to 8. It has been said, that these abscesses are always formed externally and penetrate inwards, while exactly the contrary is the case: for, although we may sometimes meet with abscesses that are quite superficial, and only covered by the peritoneum, yet these have formed at different depths in the substance of the liver, and gained the surface by reason of the natural tendency of organs to expel abnormal productions. *Number.*—Of the 66 autopsies, in 41 a single abscess; in 16, 2; in 5, 3; and in 6, a still larger number were met with. *Size.*—In 56, the abscesses varied from the size of an orange to that of the fœtal head; in 11, from the size of a walnut to that of an orange; and in 11, they were less in size than a walnut—the latter being generally in large numbers, although the larger ones were also sometimes multiple. *Pus.*—This was found to be phlegmonous in 50 instances, serous in 3, coloured by bile in 6, and of the colour of wine-lees, sometimes smelling like gangrene, in 11. *Termination.*—In 30 of the 66 cases, death took place before the abscess was broken or opened; and in 25, the pus had burst into neighbouring parts. In 11 instances, the abscesses were opened by the bistoury, and in no instance did it burst externally.

State of the Liver.—The size of the liver was noted as increased in 59 cases, diminished in 2, and normal in 5; and in 50 cases in which its consistency was noted, rammollissement was observed in 34, an increased consistency in 10, and partial gangrene in 6 cases. From among 49 cases the colour was found deeper in 30, and paler in 19: so that increase of size, rammollissement, and a deeper colour were the most general appearances observed, although suppuration also co-existed with opposite states. The variable conditions in which the liver is found, show how little the constancy of the anatomical characters of its inflammation is to be relied upon; so that whenever there have been symptoms of hepatitis during life, and we find after death that there are characteristics which differ more or less from the normal state, we may regard them as signs of inflammation. After dysentery, in the course of which signs of inflammation of the liver have been present, all these anatomical changes are met with, even when no suppuration is present. The size the liver attains, when abscess is present, is sometimes enormous, as it may mount up to the third intercostal space, extend from one hypochondrium to the other, or descend as low as the crista ilii. In none of the cases was there found the purulent infiltration mentioned by authors. When gangrene of the organ was met with, it was always in connexion with a gangrenous abscess, unsurrounded by any cyst.

In the 44 instances in which its condition was noted, the *stomach* presented traces of more or less intense gastritis in 21, while in 23 there was no sign of such complication. In 57 cases there were traces of old or recent dysentery.

The *diagnosis*, usually easy at an early period, is not always so when the existence of abscess has to be decided upon. The state of the respiration affords the most valuable aid; for when this is short and uninterrupted, and that perhaps without the patient being aware of it, abscess is certainly present. The detection of abscess may be very difficult when the case is not seen from the beginning, or when it is complicated by other affections; and in numerous instances it has been met with when never suspected during life. The *prognosis* in simple primary hepatitis is very favourable, as active, well-directed treatment will always secure a cure. Fortunately, in the ordinary simple endemic periods, these cases are those that most frequently occur; but there is a great liability to relapse, which, if the patient remain within the endemic focus, frequently leads to suppuration—so that if many cases of disease are cured in the first instance, very few patients are ultimately saved. In abscess, 5 out of 6 cases are beyond the resource of art, either because of the gravity of the general symptoms, or from the bursting of the abscess into an adjoining organ.

Treatment.—The disease must be early attacked with activity, even in spite of the presence of paroxysms of marsh fever. Guided by the degree of tension of the pulse, general and local bleeding must be had freely recourse to. During this period, all medicinal substances capable of exciting the liver or stomach, as emetics and drastics, must be abstained from; and even calomel itself should not be given until after the first few days, when, the febrile symptoms being allayed, it may be administered with opium until salivation is produced. The author speaks highly of the employment of milk-whey, to which manna is added (30 to 500 parts), this exerting a valuable modifying power upon the biliary and intestinal excretions. It may be continued for several days. When the pain and dyspnœa are not sufficiently relieved by the bleeding, and signs of suppuration are not manifest, a large blister is highly useful; this, if the engorgement continue, being dressed with mercurial ointment. Blisters, however, require very cautious employment at first, as they may only add to the irritation. If the signs of suppuration present themselves, we must content ourselves with combating the general symptoms and complications, and watching the course the suppuration will take. Quinine is required when there are true paludal paroxysms, or when the shiverings and sweatings exhaust the patient, even when they are not of a paroxysmal character. When the abscess points externally, it should be at once opened; but in the absence of pointing, more caution is required, as it is not always possible to be certain of the presence of matter and the formation of the necessary adhesions. M. Dutroulau recommends that a sufficiently large aperture should be made, and that it should, when the abscess is deep-seated, be funnel-shaped, or wider externally. He is not in favour of injections, unless the bad quality of the pus call for their employment. The regimen requires to be more severe than in other inflammatory diseases, all irritation of the stomach being especially avoided. A more generous diet may be allowed, when the general state is satisfactory, even when suppuration is present.

V. *On the Treatment of Acute Mental Alienation.*

By Dr. Casimir Pinel.

This memoir, though embracing the treatment of acute insanity in general, of which its author, a nephew of the great Pinel, takes an able critical and historical survey, is especially devoted to the exhibition of the great efficacy which results from the employment of prolonged tepid baths, in conjunction with that of cold applications to the head. We do not know that we can give a better account of the paper than is contained in the following propositions, with which Dr. Pinel concludes it:—

"1. A great number of the therapeutical agents employed in our own times were known to the ancients. 2. Treatment by moral means was so employed by them as to indicate that they had a thorough knowledge of the affection. 3. During eighteen centuries the blindest empiricism directed the treatment of the insane. 4. It is to P. Pinel that the glory of having brought about a complete reform in the treatment of this disease is due. 5. To him we owe the more moderate employment of blood-letting, the more judicious use of baths and douches, the suppression of chains and corporeal coercion, and the application of moral remedies and of hygienic rules, that had been so long neglected. 6. To his disciples, and especially to Esquirol and Ferrus, belong the honour of having followed in his traces, and of having realized projects he was unable to carry into execution. 7. As in other diseases, there are certain principal conditions in insanity in the absence of which recovery can be rarely looked for: these are the acute form, the absence of complications and hereditary predisposition, an age not too advanced, and a speedy and rational treatment. 8. With such conditions, about as large a proportion of persons suffering from insanity recover as of those suffering from diseases usually reputed as among the most curable. 9. The general opinion, then, that insanity is very rarely, if ever, curable, is erroneous. 10. Hereditary predispositions, so frequent in mental diseases, render the cure more difficult; but still a certain number of persons who are subjects of these are susceptible of recovery. 11. The delay, hesitation, or repugnance felt by families at placing the insane in special establishments is a powerful cause of their not recovering. 12. It may be possible to treat some patients at home, but in the great majority of cases this cannot be done. 13. The *relative* isolation of the patient in a special establishment becomes, therefore, the first step to take; and such sequestration is called for in the interest of the patient, of his friends, and of society. 14. It is to the want of this sequestration, brought about by the indifference or neglect of relatives, and by the fear of the authorities of infringing personal liberty, that most of the unfortunate accidents occurring during a paroxysm of insanity are attributable. 15. The different forms of monomania, moral insanity, instinctive insanity, and the early stages of paralytic insanity, are generally misunderstood by the public and by the magistracy. 16. The alienist physician is not always listened to, even when his advice has been sought. 17. The treatment of insanity is preventive or curative, the former being principally of use in the case of hereditary predisposition. 18. The simultaneous and rational employment of somatic and psychical treatment is almost always necessary. 19. The importance of moral treatment, in the sense understood by Leurret, has been greatly exaggerated; while, on the other hand, some practitioners neglect far too much moral means, resorting almost exclusively to physical agents. 20. Those who have lived some time among lunatics are well aware that it is necessary to act upon them sometimes by physical and sometimes by moral means, and very often by the two conjoined. 21. Blood-letting is the medicinal agent that has been most abused; since the time of Pinel it has been employed less frequently and with more discernment, but it is still resorted to too often. It may safely be affirmed to be more often injurious than useful. 22. Purgatives, narcotics, bark, &c., may be prescribed with advantage; but for the most part they are only auxiliary means. 23. Alienist practitioners have generally acknowledged the utility of baths. 24. Most of them have admitted the necessity of prolonging their duration, chiefly in the paroxysms of mania; but this duration has been limited to a few hours. 25. Lotions, affusions, and irrigations have generally been applied in an imperfect and irregular manner, although some improvement has taken place since the reading of the author's and M. Brierre de Boismont's papers before the Academy of Medicine. 26. The method the author has employed in the various cases of acute insanity since 1837 consists in the simultaneous use of prolonged baths, and of irrigations to the head. The temperature of the baths is a mild one; and their duration, according to the indications, varies from one to twenty hours. The irrigations may be either continued the whole time or interrupted, and the jets may be varied both in size and number. The water employed for them must never be of a very low temperature, especially in winter. 27. Baths of short duration are in general more hurtful than useful; and when baths are employed without frequent affusions or continuous irrigations, they increase rather than diminish the cerebral accidents. 28. Beyond all contradiction, prolonged tepid baths with continuous irrigations constitute the best means of treating the acute forms of insanity, and that not only in mania, but in the different varieties of partial delirium. It is an error to suppose that they are unsuited to cases of melancholic delirium. 29. The author has treated 157 cases of insanity by this means, which may be thus classed: 57 maniacal delirium; 38 lypemania; 20 monomania; 21 suicidal delirium; 16 delirium tremens; and 5 erotomania. Of these, 90 were males and 67 females; and of the 157 cases, 125 were cured. 30. Moral causes of insanity (122) were far more frequent than physical (39). 31. Hereditary influence was proved to have existed in a little less than a fourth (37). 32. Of the 157 cases, 79 (50 men, 29 women) were unmarried, 66 were married, and 12 were widowed. 33. The mean age was about thirty-two years. 34. The mean duration of the disease in the 125 recoveries had been two and a half months, and in 101 of the number only one month. The mean duration of treatment was four months. 35. The exact results were: none (including 4 deaths), 7; ameliorations, 21; under treatment, 4; recoveries, 125—i.e., four-fifths. The number of recoveries was in inverse proportion to the age of the patient, two-fifths being under thirty years, two-thirds under forty, and four-fifths under fifty. Before thirty and after forty, women furnished fewer recoveries than men. 36. One-half of those who recovered were unmarried; and a little more than one-fifth (28) suffered from hereditary influence. 37. A fifth part (25) experienced relapses, one-half being treated again with success. Of 9 patients who had insane relatives, about a third relapsed, and the same number recovered. 38. Of 32 patients treated without advantage, one-half exceeded forty years, and reached an age when recovery becomes rare: of the 32, 7 belonged to families having other insane members. 39. Six patients presented at their admission symptoms of general paralysis, and consequently there was little or no hope of their recovery. 40. Six had suffered from insanity one or more times. 41. Among the 32 cases in which the treatment failed, there were 9 only who presented the conditions favourable to recovery, and of this number 21 experienced amelioration." (p. 408.)

VI. *On Catalepsy.* By Dr. Puel.

To this memoir the Civrieux prize of 1855 was adjudged. The author commences by inquiring whether the cataleptic state is to be regarded as a mere symptom of disease, or to be admitted on the nosological list as a special affection. Such an affection is usually characterized by the union of several symptoms, which, varying more or less individually, yet constitute together a well-defined form; or by even a single symptom, providing this is always dependent upon the same organic lesion, or is met with in no other malady. Catalepsy is in this last position, as it presents a symptom peculiar to itself which serves to distinguish it from all other affections. This characteristic symptom consists in a disturbance of muscular movement, which allows of the trunk or limbs assuming various attitudes, the patient being unable to modify these in any manner. Catalepsy has at all times struck with wonder, and sometimes with terror, those who have witnessed its remarkable phenomena; for what, indeed, can be more astounding than the spectacle of a human being becoming motionless and senseless amidst the varied occupations of life—incapable of moving his own limbs, and yet obeying with docility all the caprices of the hand of another—deprived to all appearances of the normal use of the senses, and presenting other extraordinary psychological phenomena? The rarity of the disease has permitted few to describe it from personal observation, and those who have had this opportunity have usually seen only one or two patients and a small number of paroxysms. Hence a double source of error. On the one hand, a want of personal observation has generally led to a complete ignorance of the true conditions of catalepsy, and given rise to either the most unreasonable scepticism or the blindest credulity; and, on the other hand, each individual observer, wanting all terms of comparison, is inevitably led along a false route if he cannot resist the tendency to hasty generalization. M. Puel has made careful study of cases recorded both by ancient and modern writers, scarcely however mentioning the names of any of this country; and, by the aid of four cases that have been communicated to him, and three that have occurred to himself (the particulars of one of these being most minutely detailed), he has sought to reconcile some of the contradictions of previous writers—carefully separating the facts themselves from the hypothetical and theoretical explanations of their narrators. He believes indeed, seeing the incompleteness of early observations, that there is not sufficient material for the construction of a rational theory of catalepsy. The following is the definition of the disease in his own words:—

> "Catalepsy is an intermittent neurosis, without any notable modification of the functions of respiration and circulation, with a special disturbance of all the functions of relation, essentially characterised by the impossibility on the part of the patient of voluntarily extending or contracting the muscles of animal life; while another person may, at his will, oblige these same muscles to

pass through all the intermediate degrees, between the extreme limits of contraction and extension." (p. 455.)

In all cases of catalepsy, without exception, there has been suspension of voice and speech as long as the patient has been left to himself. This feature has not been included in the definition, as it is implied in the general immovability of the muscular system. Those instances in which cataleptic patients have been said to reply to questions during paroxysms, have been complicated with somnambulism. Several authors have regarded insensibility as a constant characteristic, but erroneously; for while, in general, there is at least an apparent extinction of sensibility, this in some cases is increased. All that can be said is, that there is a disturbed state of the sensitive functions. The vagueness of the expression represents exactly the actual state of our knowledge upon the subject, and it is equally applicable to the modifications experienced by the sensorial and intellectual functions.

We have no intention of following M. Puel in his elaborate exhibition of the symptoms of the disease as they influence the various functions of the economy. Its diagnosis, he observes, is easy, as the pathognomic sign is always present:—

"Take in your hand either the arm or the leg of a patient supposed to be the subject of catalepsy. Displace this limb, and then leave it to itself. If it remain in the position in which you have placed it, and the patient is in nowise able to change such position, you may affirm that catalepsy is present. I should observe, however, that when the result of the first experiment remains negative, it should be repeated several times, either on different limbs, the trunk, or the neck—in a word, upon the various mobile parts of the body: for, as we have seen, the contraction of certain muscles being sometimes excited with difficulty, the catalepsy may seem to be partial, and not be at once evident in all parts of the body. In certain diseases, when the pathognomic character is wanting, we seek our diagnosis in the *ensemble* of the symptoms observable. Here, however, this sign is indispensable, and in its absence catalepsy cannot be said to exist. We must place in the category of doubtful cases all those in which it has not been explicitly mentioned, excepting in the case of some of the observations made by the ancient authors, when analysis in the study of disease was not carried so far as at the present time." (p. 488.)

The non-existence of this symptom renders it easy to distinguish this disease from others which in some respects may resemble it—as hysteria, tetanus, lethargy, ecstasy, &c.

Predisposing Causes.—Analysing the 150 cases he has collected, M. Puel finds nothing decisive in regard to climate, seasons, locality, or hereditary influence. The *age* has been indicated in 94 cases only. From these it results that it is much more common below thirty, when 74 cases occurred, than above forty, when only 24 occurred—there being no cases between thirty and forty. The period from twenty-one to thirty comprised more than a third of the whole number. *Sex.*—The statement which is true at present that females are more liable to catalepsy than males, has not always been correct. The sex is indicated in 148 of the cases. Of 21 cases, however, occurring in or prior to the sixteenth century, 15 were males, and 6 only females. To the end of the seventeenth century, 43 cases were furnished by 29 males and 14 females; and at the end of the eighteenth century 50 males and 38 females constituted the 88 cases. The same male predominance was observable until 1841; and of the 130 first cases, arranged chronologically in the author's table, 65 are males and 65 females. Since 1841 females have predominated—so that we now have in the 148, 80 females to 68 males. *Occupations.*—These have been very various, and in several cases are not stated. Members of religious orders, students, and military persons have furnished numerous examples. Many of the cases have belonged to the upper classes of society, living a life of ease.

The *duration* of catalepsy is very variable, lasting in some cases but for a few minutes, and in others for several years. But details upon this point are wanting in many of the cases. The duration of the paroxysms themselves may also vary from a minute or two to a very long period. In the case given by Sarlandière it lasted from September 23rd, 1815, to March 28th, 1816, with the exception of a short recovery of consciousness Nov. 29th, 1815. As the usual result of the disease is a return to health, its *prognosis* must be regarded as favourable, except when it becomes excessively prolonged or complicated with incurable diseases, as mania. Almost every article of the materia medica has been enlisted in the *treatment* of this disease; and the most competent authors avow how little can be done. The treatment must be, in fact, eclectic; for in a disease of the actual pathology of which we know little or nothing, we must content ourselves with ministering to each special indication as it arises.

REVIEW VIII.

1. *Report to the Right Honourable Lord Panmure, G.C.B., &c., of the Proceedings of the Sanitary Commission dispatched to the Seat of War in the East*, 1855–56. Presented to both Houses of Parliament by command of Her Majesty, March, 1857.

2. *Observations on the Report of the Sanitary Commissioners in the Crimea.* By Sir JOHN HALL, M.D., K.C.B., Inspector-General of Hospitals.—*London*, 1857.

3. *Une Mission Médicale à l'Armée d'Orient.* Par M. BAUDENS, Médecin-Inspecteur. 'Revue des Deux Mondes,' livraisons pour Février, Avril, Juin,—*Paris*, 1857.

A Medical Mission to the Army of the East. By M. BAUDENS, Physician-General.—*Paris*, 1857.

4. *England and France before Sebastopol, looked at from a Medical Point of View.* By CHARLES BRYCE, M.D., attached, on special service, to Scutari Hospitals.—*London*, 1857.

FOR the last three years almost every number of this publication has made use of some valid personal knowledge or published records to keep its readers acquainted with all that belongs to the medical literature of the late war. True, we have had to express regret at the rarity and incompleteness of these materials—still, we looked hopefully to the future. It was impossible to doubt that our army medical staff, with the ability to instruct, would always withhold from the public the fruits of their professional experience gained so hardly and honourably during the Crimean campaign, and continue silent on the true causes of the terrible mortality which befel the army in the winter of 1854–55. Indeed, self-respect, as well as the interests of humanity and science, impose on this military department the duty of such-like publication. No one has forgotten the blame cast on the competency of the medical staff of the British expeditionary army for a large share of its losses from disease. Their numerical inadequacy to succour and save the wounded was not more roughly denounced to popular censure, than was their professional skill in the proper treatment of camp sickness. And to make this popular censure more credible and poignant, comparisons were drawn, now, between the sanitary state of the Allied armies in the field, and again, between the hospital practice of English, French, and Constantinople surgeons. However painful it is to read these disparaging estimates, and with whatever mistrust the authority for making them was looked at, nevertheless, till very recently, we were without any official statements whereby to gainsay their truth. Even now, we do not possess official documents regarding the two chief points of this comparison, namely—(1) The medical organization and administration of the English and French armies respectively, influencing the general *hygiene* of each; and (2) the professional knowledge of the regimental and staff surgeons, as tested by statistical results of medical practice in camp and hospital. The injustice done the British service, at home and abroad, with regard to the former of these two points of comparison, can be established, we think satisfactorily, by evidence drawn from the writings now selected for review. It was our wish to have embraced the latter particular also, but the means still fail us.

There is on the eve of being issued from Whitehall-yard a voluminous medical and surgical report, which, besides furnishing tabular returns of the number of regimental sick daily in hospital, the classification and details of camp diseases and of external injuries, with the issue of every case borne on the sick list, will likewise present approved dissertations on etiology, pathology, and therapeutics founded on the collated and collective observations of the whole army medical staff employed in Turkey and the Crimea. If this work prove in execution what the Director-General designs it to be, from the time, labour, and cost bestowed on its preparation, Dr. Smith will have taken a noble revenge on detractors of himself and his department in 1855. Disappointed in obtaining the promised publication for present use, we are constrained to narrow the bounds of the preceding comparison to the single question of the relative merits and demerits of British and French military administrative regulations in preserving and restoring the efficient health of soldiers in the field.

We have, indeed, long coveted an opportunity and the means to discuss this question fully. The books set forth for review, the names and designations of the respective writers, with the avowed purpose of their pages and the opportuneness of their revelations, supply these. And being the first contributions to the medical literature of the war which enable us to obtain a clear insight, if not complete knowledge, of the sanitary administration of the English and French services, it may be useful to premise what follows by some words personal to the authors.

Sir John Hall, as principal medical officer in the East, after the landing of the Allies in the Crimea, was directly answerable, so far as his power extended, for the *hygiene* of the British army. In all that concerned enforcement of available appliances against camp diseases resulting from accumulated filth, overcrowding of tents and hospital marquees, insufficient nutriment, and defective medical resources, it was his duty to advise, report, or order. And we are only chroniclers of the *now* unanimous judgment of the British army in stating, that his experience, industry, and wisdom, with exemplary self-respect, augmented his military rank. His weekly official reports and returns are models of exactness and instruction. No chief of a department was less envied than Dr. Hall for the honorary reward conferred by his Sovereign for eminent services in the field.

M. Baudens arrived in the Crimea only towards the close of active hostilities, but not before his high military rank and distinguished medical abilities were needed for the salvation of an army. It has rarely been our good fortune to witness a more dexterous surgical operator, or listen to a more eloquent expositor of medical ethics. While he proved himself indefatigable in personal labours, and daring in counsel for the due fulfilment of his "mission," his high-bred courtesy to the subordinate officers of his department insured the obedience of respect as much as that of command—*si sic omnes.* The election of a literary and political journal of *Orleanist* tendencies for the publication of his Eastern experience, does not in our estimation detract from his patriotism or professional dignity, however strange the circumstance must seem to English notions of military reserve.

To Dr. Bryce belongs, it would appear, the credit of having been selected by the Director-General to investigate at Scutari hospitals, and report directly on the comparative merits of the English and Constantinople methods of treating sick soldiers from the Crimea; for which service a former residence in Turkey, and certain published writings, were supposed to qualify him peculiarly. This investigation, we may remark, originated in a newspaper preference given to the *Perate* medication of fever and dysentery over that generally pursued by our surgeons in like cases. On completion of this special duty, Dr. Bryce proceeded to the Crimea for the purpose of observing the sanitary state and hospital means of the Allied armies; and, at a later period, he visited and closely inspected the French hospitals on the Bosphorus. The facts then and thus ascertained he embodied in official reports for the information of those whom the knowledge concerned. These reports constitute a considerable part of his present volume, the publication of which he probably considered well timed to remove some of the popular injustice continually done our military system in the conduct of the war, and restore, here and elsewhere, the just repute of English medical administration compared with that of the French, for prolonged service of troops in the field.

These preliminary observations on the *personnel* of the authors named point to the use of their writings and the value of their testimony in relation to the following questions:—

a. What was the general sanitary state of the English and French Crimean armies respectively throughout the war?

b. In what respects does the military organization of the medical department of each exercise a controlling influence over the management of sick soldiers?

c. To what extent did experience in the medical administration of both services prove the superiority of either for remedial resources available in camp and hospital, at periods of great sickness?

d. And what was the actual fighting strength, measured by a health standard, possessed by the Allied combatants before Sebastopol immediately prior to the signature of peace? (30th March, 1856.)

These are questions we have been long desirous to elucidate in these pages on authentic *data.* Let us see if we can do so by making contributory to the attempt the records which we have put at the head of this article. For this end, we now propose to invite attention, first, to the facts of the case as they stand in evidence; and, next, to the medical, military, and national bearings of these facts: and the directest plan whereby to accomplish the object in view is to strictly scrutinize the pages of Dr. Bryce, as the latest and most specific of the three works on the subject.

First, then, what was the sanitary state of the English and French Crimean armies throughout the war?

On application, the Director-General supplied the author with the subjoined

"*Abstract of the number of Non-commissioned Officers and Men sent to the East during the late War, with the Deaths from Wounds and Diseases respectively; also, the Number Invalided to England.*

Total number sent to the East	93,959
Died from wounds and mechanical injuries	1761*
Died from disease and all other causes	16,298*
Number invalided	12,903
Killed in action	2658†

"These numbers may be cast into another form for sake of uniformity with the French return of casualties which follows. Thus:—

"The total strength of the British force of soldiers, exclusive of officers, originally embarked for the East, and added during progress of the war, up to date of evacuation of Crimea		93,959
Reduced by deaths, killed in action, and died of wounds	4,446	
Ditto, by deaths from disease	16,298	
Ditto, by invaliding	12,903	33,647
Remaining effective strength of Crimean army, non-combatants exclusive, at close of war . .		60,312

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* The "killed in action" not included in these numbers.

† These numbers are supplied from a parliamentary return quoted in the United Service Magazine.

"These numbers show—

"A ratio of deaths to strength, *exclusive* of killed in action, of . . . . 19·22 per cent.

Inclusive of ditto . . . . 22·7 " "

We have thus, for the first time, made known, on official authority,* the enormous aggregate of deaths from disease alone, surpassing in proportion the Walcheren losses, heretofore the bye-word of military disaster: but what will no less painfully strike the medical reader is, the surprisingly small proportion of men returned "killed in action"—at least, three-fourths of the whole deaths having resulted from other casualties and conditions of war.

Another no less remarkable character of this obituary is the unequal distribution of deaths over the period embraced in the above return. Calculating the period of actual war service in the East at two years,—from June, 1854, to June, 1856, and deducting from it the three months spent by some of the troops on the Bosphorus and at Varna,—we believe that the official returns about to be issued by the Director-General will reveal the fact, that at least five-sixths of the above-stated mortality occurred during the first six months after landing in the Crimea—that is, between September, 1854, and the end of March following.

The few lines just written are full of most bitter reminiscences and of instructive reflections. It has, however, been so often and so recently our painful public duty to investigate and declare our opinion of the true causes of these lamentable occurrences, that we need not dwell here on so uninviting a theme. Suffice it that we give our readers the subjoined confirmation, furnished by Dr. Bryce's statements, both as regards the local circumstances producing fatal camp diseases, and the administrative mismanagement in which these originated and were made more deadly.

With reference, then, to the sanitary state of the English camp during the winter of 1854-55, the author named recapitulates the facts which serve to show the amount and nature of the camp sickness which prevailed, and the great mortality thence resulting for the first six months of active hostilities before Sebastopol. Thus we find it stated that in October, 1854, not more than 16,500 rank and file were actually fit for duty out of a muster-roll strength of 25,600. One obviously direct evil of this was that the soldiers were on duty four nights and days in seven: and another, no less positive, showed itself in the enfeebled bodily and mental conditions of the men. Disease was the necessary result. For four weeks, ending the middle of November, on an average there were daily transferred to Scutari hospitals upwards of 100 sick labouring under fevers and bowel complaints. As winter advanced, sickness and sufferings of all kinds became aggravated. The troops, already worn out by excessive night duties, exhausting toils knee-deep in mud, exposure to rain and cold for weeks with insufficient protection in the shape of tents, apparel, and blankets, had to experience the worse hardships of reduced rations, and these ill cooked. Not the least disastrous effect of the memorable storm of November was the increased difficulty of transporting food and fuel from Balaklava to the lines. To those who witnessed, and even to those who remember what they read of the miserable condition of the British camp at the beginning of 1855, it will cause no surprise to be now informed that, in January, upwards of 12,000 sick and wounded soldiers encumbered the regimental marquees and hospital huts at the front and the hospitals on the Bosphorus. But it is not chiefly to the fact that 8000 patients were transferred from regimental to general hospitals within a space of seven weeks, ending 20th of this month, that the author directs attention. He particularises the prevalence of typhoid fever, scurvy, frostbite, dysentery, and diarrhœa, to show that all these varieties of camp disease had a common origin in exhaustion of the vital powers from overwork, inadequate night rest, unsuitable clothing, inappropriate shelter against wet and cold, scarcity of fuel for cooking, unwholesome food, and insufficient nutriment. Dr. Bryce, here and elsewhere, insists, however, that the chief and most destructive agency in overwhelming with sickness the British army in the winter of 1854-55 was the great disparity of strength to labour,—in other words, the pressure of work in proportion to the quantity and quality of the aliments supplied for the soldiers' support. In support of this opinion he produces the following official figures :—

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* England and France before Sebastopol.

"(1.)	Rank and file effective and present under arms for the month of January, 1855	11,367
	Detailed for duty of various kinds, daily	5,321
(2.)	Sick—in the Crimea	4,158
	„ elsewhere	7,857

"This return shows that, of a numerical force of 23,382 men borne on the regimental muster-rolls of the Crimean army, more than one-half (12,015) were withdrawn for a considerable period: whence it followed that 11,367 effectives had to perform both their own duties and those of the sick."

Never, surely, was the wonderful endurance and stubbornness of Englishmen more severely tested than during the first portion of the campaign. The siege of Sebastopol was, for a time, only interrupted occasionally by darkness, and the absolute need of repose. Existence in the field was, as here shown, a never-ceasing struggle against toil, sickness, and death. How men could live under such circumstances is the marvel—not the consequent mortality.

Respecting the remoter causes of the mortality in the English camp at this period, Dr. Bryce writes with becoming independence :—

"It is not my province, nor do I presume to be the apologist of the undeniable difficulties experienced by the English regimental surgeon in the winter of 1854, from defective supplies of drugs and sick comforts, the consequence of stores missent or improperly stowed on board ship. There is no doubt of the fact that the Medical Department shared in the general unpreparedness and miscalculations that depended upon hurried action following unripe deliberations, confused plans, and divergent aims."

The author, moreover, aims in the following extract to discriminate, we think unbiasedly, between what may be fairly considered the inevitable circumstances and conditions in which the British soldier was then placed, and the culpable aggravation of his lot, resulting from inexperience of the heads of those civil and military departments whose duty it was to have foreseen and administered to his requirements:—

> "I take the liberty to express, once for all, my opinion that it has not been proven that the dread privations experienced and enormous services imposed on the English army at the outset of the campaign, can in justice be imputed exclusively to administrative faults and failings. The original inadequacy of our preparations for a sudden and great war—the timid adherence of heads of departments to the 'regulations' of the service, when self-reliance, prompt decision, and independent action for unprovided emergencies were imperatively demanded, had, I believe, a larger part in our misfortunes than the general incapacity of the executive."

Dr. Bryce enables us to contrast this amount and fatality of camp diseases, and of faulty administrative management at home and on the field, in the first six months of active hostilities, with the healthy condition of the troops, and admirable effectiveness of every department during the middle and later periods passed on the same soil; but for the statistics connected with these questions we must refer to the work itself.

He bears testimony to the great value of the weekly sick reports issued by the Inspector-General, Sir John Hall. Their reliable accuracy and fulness of details constitute them an authority for subsequent reference. In this way we know the gradual declension of camp sickness from the spring of 1855, and the progress towards an entirely satisfactory sanitary condition of the army in the autumn of the year. Thus, we find it stated that in the second week of October, out of a body of 25,172 soldiers, the proportion of sick to well, including wounded, was little over eight per cent., and of deaths to strength, eight in ten thousand. The same authority shows that throughout January, 1856, the deaths were only 124 in all the hospitals, regimental and general, in the Crimea and on the Bosphorus. More remarkable, even, is the report for the week ending the 15th of March. The strength of the British force, including non-combatants, is put down at 70,409 men, of whom only 3747 were actually under medical treatment, and the fatal cases in those seven days numbered nineteen. The same extraordinary exemption from malignant diseases continued with the English army until its embarkation for home. Dr. Hall signalized this fact in proclaiming that, for the three last months which it spent in the Crimea, the mortality was proportionably less than that of our household troops quartered in and around London. In reproducing this class of facts, Dr. Bryce takes care to remark that throughout the winter of 1855-56, the whole army was well-clothed, sheltered, and fed; while the military duties of the men served only for healthy bodily exercise. And herein lies the true explanation of the extraordinary difference in the sanitary state of the English troops at the two periods. According to Dr. Bryce:—

> "Whereas, the first winter, the army was exhausted by this overwork,

and deficient in everything to support it but the patience, bravery, and discipline of the men; in the second, the same army was in every respect in a condition not equalled by any number of troops in any part of the world."

But the acknowledged purpose of Dr. Bryce in publishing his 'England and France before Sebastopol,' is not so much to inform the future historian of the war on the remarkable phases which the sanitary state of the British troops presented at different periods of the Russian contest, as it is to enlighten him on the true relation which the health of the French army bore to its conduct and conclusion :—

> "Every soldier (he says) admits that the destiny of the enterprise, in a military sense, depended mainly on the health of the troops engaged; but no medical man has yet tried to fix the manner and proportion in which this condition contributed to the Paris conferences. Official reticence on this point is pardonable. Courtesy on the one part, and policy on the other, withholds authoritative information respecting the necessity of peace to either of the allied states, in consequence of the loss of combatants from camp-sickness. Still military hygiène, in other words, the medical facts of the war, regarded in their relation to the pacific issue of hostilities, exercised an influence which has hitherto not been sufficiently acknowledged either by the diplomatist or physician."

Accordingly, the author takes the foregoing *data* for a standard of comparison, with regard to the English army, and finds in the subjoined statement of the *Moniteur*, prepared by the French Minister of War, and published by command of the Emperor, corresponding figures respecting the *personnel* of the French troops employed in the Crimea on the same occasion :—

"The effective of the French troops embarked for the East (*envois de troupes*)		309,268
Reduced by deaths from all causes, killed in action included (*total des pertes de l'armée constatées*)	69,229	
Invalided singly, and allowed leave on furlough, during the war	65,069	
Recalled during war	20,390	
Unaccounted for (*disparus*)	1,781	
Total number returned to France and Algiers .		227,135
Ditto, after signature of Peace		141,676

SUMMARY.

Taken to the East . . . . :	309,268
Lost there	69,299
	240,039
Re-entered France and Algeria	227,135
*Difference**	12,904."

Placing the numbers given in the English return (p. 129) and those of the French paper in closer juxtaposition, we find the following percentage results :—

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* "This *item* disturbs all calculations. Its meaning in a military sense is perfectly unintelligible, even with the explanatory note subjoined to the '*rapport*.'"'

	English.	French.
Diminution of strength by deaths	22·7	22·99
" " " invaliding	17·34	21·4
Hors de combat	35·82	44·3
Troops in the East at close of war	64·18	47·28

With reference to these tabular statements Dr. Bryce remonstrates against the insufficiency and inaccuracy of the French portion. For many reasons, it was not to be expected that our ally would sanction the publication of periodic reports similar to those of the English Inspector-General of Hospitals. We are, consequently, entirely without official information of the total amount of sickness, of wounded, and of deaths, in the French camp for any stated period; and equally uninformed of the aggregate of sick to healthy, and of deaths to strength, till after the return of the army to France, where something of the kind is affected to be done in the report of the War Minister, which does not pretend to be—as we know otherwise it was not—founded on medical authority. But there are other strong grounds for mistrusting the conclusiveness of the above-quoted summary. We shall here mention only one,—the slight difference in the percentage losses by death experienced by the two armies from the first day they entered upon active hostilities—say, disembarking at Varna, till the last transport reached her moorings in England and France respectively. Why, since commencing the present article we have seen it boasted in the 'Patrie,' of 16th October, that France sacrificed two hundred thousand men in the Russian war, for the conservation of Turkey; and therefore her paramount right to decide the question of the Danubian Principalities. This estimate, notwithstanding its appearance in a semi-official Parisian print, is no doubt exaggerated and tolerated for its political argument. But to put down the deaths from all causes below twenty-three in a hundred is going more surely to the opposite extreme of credibility. It is quite fair to set the worst times of the two armies and their best times against each other, for comparison—that is, the first winter of the English against the second of the French. But we do not believe that the proportionate losses of the former ever equalled those of the latter. Dr. Bryce refers to high medical testimony in corroboration of his opinion that the rate of mortality in the ranks of our ally was not inferior to our own, for three months together, at any period of hostilities. There is room for cavil, however, on this point: on the other hand, it cannot be disputed that, for several months preceding the final evacuation of the French hospitals in the East, the mortality in them exceeded in amount and proportion whatever was known or supposed to be the case with ourselves.

This latter averment the author of the work last-named proceeds to substantiate by what he personally observed in the French camp and hospitals, and by the recorded experience of M. Baudens, in his 'Mission Médicale.' But, first, he shakes the military testimony of the French Minister's report in a rather rough examination of its phraseology. We give this passage of arms, as well for its bearing on the controversy provoked by Dr. Bryce, as for its showing his "skill of fence"—

"The military critic needs not to have pointed out the very equivocal terms employed in this tabular statement. It is for others that I venture to indicate certain anomalies and misleading phrases. (1.) By effective strength (*l'effectif*) is usually meant soldiers fit for immediate active service. But in this category are numbered the ambulance sick in the Crimea on the 30th March, who, according to M. Baudens, amounted to 19,648 in the preceding month, besides the above 10,448 under treatment in hospitals on the Bosphorus on the very day when the report calls them effectives. By this means the War Minister augments his numerical belligerent force by upwards of thirty thousand nominally effective troops; and so makes it appear that 73·44 per cent. of the Crimean army was restored to France after the signature of peace in a fit condition to have continued active hostilities—a demonstrable fallacy. (2.) Fifteen thousand troops collected in the regimental sick depôts outside Constantinople and elsewhere are similarly designated and registered. (3.) The ministerial reporter allows himself a margin of twelve thousand nine hundred men not specifically accounted for. With regard to this rather considerable *item*, being, in the phraseology of the report *une différence entre les envois de troupes et des hommes revenus de l'armée*, it is obscurely explained that the number is made up in part of persons subsequently disrated as soldiers, though so classed and counted on embarkation; and in part of others who, returning from and proceeding to the East oftener than once, were in consequence reckoned as multiples of a single individual, and thus to an indefinite degree enhancing the paper strength of the army. Military readers may probably extract a more professional meaning than the writer is able to do out of the original text, for which purpose the passage is given. They will please to remark that in the '*départ*' of the report the total are called '*troupes*,' in the '*retour*' '*hommes*.' Ought the '*différence*' to go to the reduction of the former sum, and consequent proportionate increment of losses by death and otherwise? or is it simply a novel mode of balancing the debit and credit sides of an imperial expenditure of which the particulars cannot be produced?—a device for concealing the disappearance from the muster-roll of any number of persons not otherwise accounted for?—in which category French surgeons have assured me were many hundreds embarked at Kamiesch for hospitals on the Bosphorus, but who found a resting-place mid-channel. M. Baudens declares that, at one time, two hundred soldiers died daily between the Crimea and Constantinople. Another strange record is that 1781 men have disappeared—*disparus*—died, so far as anything is known of them. They are added to the total loss, but no records vouch for the time, place, or manner of their deaths.* Hence is obvious the impossibility of making a really just and useful comparison between the losses by deaths sustained by the two armies respectively—the terms and elements of calculation furnished by each not being equivalent. Moreover, the French War Minister's report does not, except in one instance, distinguish betwixt the deaths, the result of actual fighting, and those from camp diseases alone. This important distinction is made in the English published returns. Again, the latter distinguish the numbers invalided, while the former include under one cipher, invalids, convalescents, and *congés* returned to France."

Let us now see what M. Baudens says tending to rebut or confirm those statements of the English writer. It is not for us to account for the circumstance that the chief of the Medical Staff of the French Army in the East gave to the public the results of his Crimean observations first in a political periodical of dynastic sympathies—*not Napoléoniennes*. Equally curious it is that the publication of his experience should *follow* the Imperial *compte rendu* vouchsafed to the French people, albeit not quite confirmatory of the ostensible purpose of the official information. Nevertheless, it is all the more our pleasing duty to commend the judgment, independence, and impartiality, as well as admirable literary skill with which M. Baudens has executed his delicate task. Although M. l'Inspecteur-Médecin himself never for a moment forgets, nor allows others to forget, his nationality and its high pretensions, still, his egotism is rarely offensive, while his bearing is ever that of the *gentilhomme de l'ancienne cour.* We need not add that the strictly medical portions of his narrative show how thoroughly well he appreciated and discharged his professional mission to the East.

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* "I am permitted to state, on the authority of the Director-General, Army Medical Department, that of the British expeditionary army not ten soldiers are unaccounted for, at this day, in the records of his office."

With reference, then, to the state of health of the French Crimean troops—the point under immediate consideration—we find M. Baudens giving the history of and describing the vast hospital accommodation at Constantinople provided for and exhausted by the demands of the service. Upwards of twenty thousand sick labouring under the most fatal of all camp diseases—typhus fever, dysentery, scurvy—filled to pernicious overcrowding the stone buildings and wooden barracks appropriated and constructed for their reception. Proceeding to the front, a month later, he found the fourteen divisions of the army, by the muster-roll 140,000 strong, each provided with its regulation ambulance service, and collectively capable of and actually sheltering several thousand patients.[*]

Again, as respects the sad condition of the sick brought into the hospitals on the Bosphorus, he says, that for the most part, they were afflicted with bowel complaints, intermittent and remittent fevers, and, above all, scurvy:—that among the wounded affected in this last manner the tainted blood became so fluid, and exuded so copiously from the sores, that the most energetic means failed to arrest the bleeding, which thus often proved the immediate cause of death. Hospital gangrene inflicted the most frightful ravages:—that many of the wounded brought it with them from the Crimea, and those who had escaped it there were attacked soon after arrival in the hospitals. Thus it happened that wounds almost closed, and considered in fact cured, reopened on invasion of this disease. (No. for February, p. 879.)

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[*] It is a remarkable fact that M. Bandens' official report to the Minister for War, written November, 1855, wherein he describes the deplorable amount and virulent character of camp disease, and the defectiveness of sanitary means, omits to state the number of sick actually under treatment in the Crimea. This omission is made more significative from his giving the subjoined approximation—we cannot call it a computed return—for an earlier period.

" Voici l'état sanitaire de l'hiver 1854–55:—

	Effectif.	Malades.
Octobre	46,000 hommes.	3200 hommes.
Novembre	55,000 „	5000 „
Décembre	65,000 „	6000 „
Janvier	75,000 „	9000 „
Février	86,000 „	8000 „

Dans ces chiffres ne sont pas compris les malades des infirmeries régimentaires.[†]

[†] Revue des Deux Mondes, livraison de Février, 1857, p. 905.

M. Baudens estimates that two-thirds of all the fever cases admitted into the Constantinople hospitals suffered also from diarrhœa or dysentery. "Indeed, diarrhœa was so prevalent that nearly every other disease may be said to have been preceded by it in an acute form, while a chronic form of it followed and closed the principal affection. . . . . Moreover, our hospitals were filled with divers fevers in addition to cholera and dysentery. . . . . One consequence of this state of things was, that the comparative leisure which we were permitted to indulge in at the commencement of the winter, 1856, was very short. The attention of the Medical Staff was speedily concentrated on scurvy and typhus, which raged with cruel intensity. . . . . The invasion of contagious typhus was the most terrible trial which our Eastern army had to undergo. At Constantinople, the augmentation of sick in the hospital of Faond-Pasha caused it to burst forth suddenly therein. Other hospitals were successively attacked by it, and its influence extended even to the convalescent depôt at Maslak, which had escaped until then. Speedily the typhic cases formed one-fifth of the whole hospital sick, while the mortality rapily augmented: such, too, was its mode of progression in the Crimea. There, during the month of February, the total number of sick rose to 19,648, of whom 2,400 died, and 8,738 were transferred to the hospitals on the Bosphorus. For the same month, these hospitals held 20,088 sick; there were 2,527 deaths, 649 transferred to invalid establishments on the Dardanelles, and 3,617 invalided to France. Hence, the imperious necessity to have recourse to the most energetic measures, without which the mortality would have been unlimited."*

As the soldiers' tents and huts furnished occupants for the ambulance service at the front, so this was the prolific feeding-ground whence were transported supplies, for four months daily, of two to three hundred sick to the hospitals in and around Constantinople; to make place for whom, again, wards were emptied into ships freighted for France.

M. Baudens, speaking of his first visit to the Crimea, states that the first question which presented itself to him was,

> "Did typhus exist in the ambulances alone, or did it prevail equally in the regimental quarters? I soon satisfied myself that the latter was the fact." (June, p. 626.) "Hence the transport of sick from the Crimea to Constantinople became very large. Hence, too, the necessity to open fresh hospitals for their reception. In the month of October, 1855, one capable of accommodating 1200 patients was established at Ramio-Tchiflik, and another at Pera not so large. The following months other hospitals, in various localities, were opened for 6700 sick: besides which a barrack camp at Maslak was prepared for the reception of convalescents. During all this period invaliding to France was prosecuted. In one month 6000 were so transported. The half of our ships, instead of returning to the Crimea, made sail to Marseilles and Toulon, and for want of ships fever sick were brought down from the Crimea. At this crisis, typhus infested the ships, and was carried to France. Hence it was necessary at once to keep all the fever cases in the Crimea, and to send all others to Constantinople." (June, p. 625, *et seq.*)

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* Livraison de Juin, *passim*.

At the risk of fatiguing our readers we shall have to give further extracts from M. Baudens, in order to do justice to his courageous plainspeaking, and to show our appreciation of the value of his revelations. We are thankful for the information thus furnished, though we could have wished more fulness upon some points. No medical or military man can read his statements without perceiving the restraint—probably political—under which his pen moved. He nowhere, for instance, gives the ratio of sick to strength, and that of deaths to sick at the front, for any stated day, decade, or month. The only information of the kind is when he says that "in the last ten days of February 519 cures and 873 deaths were registered. In respect of typhus cases alone, the mortality was most frightful. Only 27 cures could be set against 383 deaths." (June, p. 627.)

Lastly, we quote the obituary enumeration of the Inspecteur-Médecin.

> "If we consult," he says, "the medical statistics of our hospital establishments, which alone claim our present attention, we find that the number of deaths recorded in our Eastern Hospitals was about 63,000, of which 31,000 occurred in the Crimea, and 32,000 at Constantinople." (June, p. 635.)*

2. In critically examining the pictures, thus closely traced from an English and French point of view, of the sanitary state of two armies engaged in the Russian war, and in passing on to the second head of our subject, it does not need much medical acumen nor military sagacity to direct one's mind to the question, how far military organization was answerable for the scenes witnessed and the colours in which they have been here vividly depicted? This question becomes all the more interesting, and the answer important, if it be known beforehand that the medical organization regulating the two armies differs from each other in several essential particulars. Dr. Bryce appears to have fully appreciated the importance of this fact and its bearings. Be this as it may, it is very certain that the insight which he has given of the working of the two systems will prove as acceptable to, as it is laudatory of, our regimental and staff-surgeons who served in the East.

The author will please to pardon the length of our extracts in consideration of the difficulty of further condensing his language.

> "In the English army the regimental service for the sick is held of chiefest importance. . . . . Under almost every circumstance the surgeon obtains and keeps charge of the sick and wounded of his regiment. He is responsible for their treatment, of which he reports directly to his own department. To him also belongs, in the first instance, to recommend patients for change of climate, for invaliding, and so forth. According to French military administration, the duties of the regimental surgeon are altogether subordinate,—in the field to the *ambulance* service,—in garrison to the hospital staff. The regimental surgeon, although of advanced rank, *chirurgien major*, examines the soldier of his corps who reports himself sick only to determine whether the illness is feigned

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* To this total must be added the loss of one-half of the twelve thousand men who formed the Dobrudscha expedition, which preceded the landing in the Crimea, all killed in action, and those who died betwixt Kamiesch and the Bosphorus.

> or slight, in which case he is dealt with by the surgeon. But, if the treatment be likely to require more than a couple of days' attendance, the applicant is at once sent elsewhere to obtain it. On the field, after an engagement, his professional duties are restricted *aux premiers secours*, which rendered, the wounded of his regiment pass entirely from under his observation.
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> "For the English army in the Crimea there were provided—1. A field hospital within the lines; 2. A general hospital at Balaklava; 3. Hospitals, or *sanatoria*, in its vicinity. . . . . All three may be regarded in the light of *rear* hospitals to an army in active campaign; Scutari establishments on the Bosphorus holding the place of its *general* hospital.
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> "In the French service, on the contrary, there is no regimental hospital provision for the continuous treatment of the sick or wounded. *Les hôpitaux ambulans* occupy the first place in its medical organization. Every *corps d'armée* has its separate service of the kind *L'hôpital ambulant* accompanies its movements, and on the efficiency of this army attendant mainly depends the welfare of the troops.
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> "In the French service, the duties of the Medical Staff are performed under the authority of the War Minister, delegated either to the Military Commander-in-Chief, or to the officers of the *Intendance* (*fonctionnaires de l'intendance militaire*). This is a body and name unknown in the English army. Composed of officers of various grades permanently withdrawn from regimental duties and promotion, and charged with the administrative direction of garrison and field hospital services, it commands the Medical Staff in all things pertaining to military discipline, enforces observance of the rules, and superintends the duties of '*police*' in the hospitals; which *police* means maintaining regularity in the medical visits, good order among the medical attendants, the orderlies, the sick, and others. The *intendance* also fixes the number of beds and amount of furniture to be put in a ward, appoints or approves of surgeons to particular charges, and removes them at pleasure, signifying the same through the *médecin principal*. . . . . Lastly, as a distinguishing feature of the two army medical systems, the *corps de pharmaciens* is a perfectly distinct service, little lower in relative rank to the medical staff, and, equally with it, subject to the orders of the *intendance*. . . . .
>
> From this statement of facts may be deduced two just conclusions—one, the thorough dependence of the sanitary state of the French troops in the Crimea on the efficiency of its *ambulance* system; another, the considerable dependence of this efficiency on the intelligence and integrity of the *intendance*."

For Dr. Bryce thus to specify the functions of this administrative machinery is to show that it was mainly answerable for the results which we have seen followed its action in the Crimea. But not to be accused of English prejudice in this opinion, let us see what M. Baudens himself says of *Intendance* authority and interference in matters of military *hygiène*.

And first, by quotation, as respects the subordinate position and inadequate power for good held by the French Medical Staff:—

> "It was not," says M. Baudens, "till after the fall of Sebastopol that we succeeded in establishing regimental infirmaries. . . . . In some of these the sick had a strong sacking stretched over a wooden framework or hurdles, with a sort of straw matting to lie on; in others they were forced to make use of the bare filthy plank of a camp bed. A large number of the huts were whitewashed inside, and purified with chlorate of lime. These sanitary means were, however, sometimes neglected; and the dieting of the sick presented

similar irregularities. But attention to cleanliness was the thing most wanted. The indifference to this point was altogether incomprehensible. In each of these places was to be seen a score of limping, idle fellows, with time hanging heavy on their hands, who would not employ themselves in keeping clean their own abodes. And yet, such like neglect was tolerated, even to the sacrifice of the sick inmates. . . . . True, that in war time our hygienic resources are limited, still some precautions are indispensable for safety."

M. Baudens complains that only in two or three hospitals was any record kept of the wounded; and hence the impossibility to prepare authentic documents bearing on the casualties of the war. (April, p. 588.)

Of course, M. Baudens would not have so complained if even his rank of Médecin-Inspecteur and extraordinary powers could have remedied these evils.

Continuing his exposure of the worse than ignorance in the principles of *hygiène* on the part of the *Intendance Militaire*, and combating its assumptions of a wisdom above the teachings of medical science in what concerns the well-being of sick soldiers, M. Baudens says:—

> "It is undeniably a pernicious practice to crowd sick tents and huts into a confined area. Granted, that the exigencies of the service necessitated such a proceeding in the Crimea, but the same overcrowding took place at Constantinople, where ample space was available; and it is to this condition of the hospitals that I ascribe the persistence of cholera and the prevalence and ravages of typhus and hospital gangrene within them. When the surgeon asked for more room, it was answered that facilities for carrying on the ordinary work of the place deserved the first consideration; and hence, in order to economise a few paces in passing from one hut to another, the most simple and self-evident laws of preventing diseases were violated. Besides, the surgeon was not even consulted respecting the situation for an hospital; and it happened that at Constantinople one was placed in the immediate vicinity of a marsh, and had to be abandoned because of its febrific emanations." (February, p. 896.)

Pretty strong language this, considering the reserves and qualifications, military and political, imposed on free speech in France. Fortunately, the commentator having already reached the highest grade in the service, his promotion cannot be stopped by the votes of his colleagues of the *Conseil de Santé.* Moreover, we presume M. Baudens has abandoned all desire of future active employment in a military capacity. If any one doubt this inference, let him read the following passage. Speaking of the fearful spreading and extraordinary fatality of typhus in the hospitals on the Bosphorus, he relates how long and earnestly he pleaded with the *Intendance* that they would permit the fever cases to be put into separate, thoroughly ventilated wards, in order, as a least benefit, to withdraw other patients from the dangers of typhic propagation:—

> "But the Army Medical Staff and the *Intendance* functionaries rarely interpreted the phrase overcrowding (*encombrement*) in the same sense. The latter stuck to the strict letter of the military rule. So long as a patient had the regulation allowance of cubic feet, overcrowding was an impossibility; while the physician saw it to exist from the moment when disease is aggravated and

its fatality augmented by reason of too many sick being congregated within a given space. It was under these circumstances that our English ally offered to us the aid of their personal and material resources. General Storks proposed to build and completely furnish for us hospital accommodation for a thousand patients, for whom he would also undertake to supply food and medical attendance." (June, p. 621.)

Seemingly to challenge denial and provoke controversy on the justness of his censures and objects of his blame, M. Baudens ventures to give the preference to English over French medical organization. Every one who had the advantage of personal intercourse with that distinguished officer in the East will feel how strong his convictions must have been to have acknowledged in print this superiority at the expense of his sensitive patriotism and *esprit de corps*. For example, he says:—

"The English hospitals were remarkable for cleanliness. We have seen that this quality did not exist in ours. The difference is partly due to the higher and more independent military position which the English surgeon holds, and which entitles and enables him to exercise greater authority in hygienic measures. His ordinary sick diet table is more ample and varied than the French; and the surgeon can order what *extras* he thinks proper for the sick. Indeed, the English camp was abundantly provided with stores and comforts of all kinds, to which circumstance is to be ascribed its preservation from scurvy and typhus in 1856. When we compare the conditions in which English soldiers were placed at the commencement of the war, which took them unawares, with those in which they were in 1856, we are forced to acknowledge the greatness of the British nation." (February, pp. 882, 898.)

As before intimated, we read in these passages a significance beyond a mere verbal interpretation of them. Every fact thus stated in commendation of the sanitary means, remedial resources, and sick comforts available by the self-directing English army surgeon for the proper treatment of his sick, points to a default of similar provisions and power entrusted to the honour and skill of his French colleague for the benefit of the French soldier. In this sense we most heartily pray that the statements of the Médecin-Inspecteur may be understood by the War Minister of Napoleon III., and then M. Baudens' "*mission*" will not have been written in vain.*

3. We have proposed to ourselves, as a third inquiry, the question—To what extent did experience in the medical administration of both armies, English and French, prove the superiority of either for remedial resources available in camp and hospital at periods of great sickness?

The medical history of the war records that the two armies did suffer an amount of losses from camp disease only paralleled in modern times by that of the Russians in the Turkish campaign of 1828. But with this striking dissimilarity, that, whereas the English army was subjected to its most destructive visitation of sickness during the first six months of its position before Sebastopol, and was exempt from even the ordinary amount and virulence of camp sickness for the last six months of its occupation of the Crimea,—in the case of the French troops, under seemingly similar conditions of locality, service, and atmospheric influences, the very opposite of these sanitary states prevailed at both times: their general health being reported good at the earlier period, but becoming so bad in the latter that M. Baudens exclaims—"Nous étions menacés d'un veritable et affreux désastre. Il fallait aviser, agir promptement, sous peine d'être bientôt réduit à l'impuissance; il y allait du salut de l'armée."[*]

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* M. Baudens' successful attack on this system, and its instant beneficial effects, were occurrences of too late date to influence strategic operations. His fearless remonstrances and direct approach to the Emperor obtained for him an exceptional authority, by which, and his intelligence, he saved many thousand lives to France.

We are aware some persons, Dr. Bryce among others,[†] doubt the comparative freedom from camp diseases of the French in the first winter; but, in the absence of authoritative records to the contrary, we will assume the event to be as here stated. There is no doubt of the fact being as above given with regard to the English force. What, then, is the explanation of this striking difference. The problem has nowhere been yet worked out in print, as far as we know of. Something is, no doubt, due to the very opposite states of preparedness, founded on constant practice in the field, with which the two nations entered upon the Russian war. The Eastern expedition was, to the majority of the French troops, merely a change of territory from Algeria to the Crimea, whither they transported their customary fighting weapons, habits, and provisions, for the conduct of a formidable war. England, on the contrary, had well nigh ignored from desuetude the experience gained in her Peninsular campaigns. Hence the original inadequacy of our preparations for a sudden and great war, the timid adherence of departments to the "regulations of the service," when self-reliance, prompt decision, and independent action for unprovided emergencies were imperatively demanded. But, while administrative and executive failings and faults may account in some measure for the sufferings and sacrifice of life endured by the British army at the beginning, a similar explanation would be neither applicable nor acceptable in respect of our ally at the close of hostilities. Figuratively speaking, the Gaul, in virtue of more experienced handling, took the lead and kept the first place in sanitary matters, whilst the Saxon, not up to the mark at starting, lost ground. But then the latter trained on under work, and became actually fresher and stouter at the finish than when first stript for the encounter, while the former seemed to exhaust himself under the prolonged struggle, and left off worse for the energies put forth.

We abstain from polemical discussion touching the blame or merit justly due to systems or individuals for this extraordinary state of things observed in the English and French camps. Enough that we recall to the minds of our readers how often and how earnestly we were exhorted, early in the war, to compare the inefficiency of England with the scientific completeness of France, and how invariably this comparison was turned to the disparagement of ourselves. "Our own Correspondents," with hardly an exception, unhesitatingly attributed the diseases which affected our troops to the negligence and incapacity of the departments charged with administering to their health, while the same writers pointed to the sanitary state of the French in evidence of their truth and sagacity. It followed that the French medical administration was especially recommended for our instant adoption on its extolled superiority, because fewer deaths were reported in the ranks of our ally. Alas for human prescience. The progress of the war and its close showed how utterly premature were the terms and teachings of this comparison. Tested by longer experience, the French medical service completely broke down under the pressure and in the presence of disasters undeniably within administrative competency to avert, control, and remedy. On the other hand, the English system could not be inherently what its detractors represented, otherwise it would not have recovered itself so promptly and effectually as it did amidst and in spite of overwhelming difficulties from without. We have not the slightest wish to depreciate the excellence of the French army. But seeing that in 1855-56 it underwent sufferings and losses from disease far greater than those which the English experienced the winter before, the conclusion is irresistible that the medical administration of our army, in so far as it referred to sanitary arrangements, cannot have been so utterly bad as it was once the fashion to argue. In no boasting spirit the author of "England and France before Sebastopol" observes:

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[*] Op. cit., Juin, p. 622.

[†] "I very much doubt, founding my incredulity on high medical testimony, whether the rate of mortality from disease alone was ever considerably below that of the British for three months together."—*England and France before Sebastopol*, p. 16.

> "The first winter the English army was exhausted by overwork, and deficient in everything to support it but the bravery and discipline of the men; in the second, the same army was in every respect in a condition not equalled by any number of troops in the world. To the Medical Staff is now justly attributed a due share in this amelioration, in spite of the attempts made in high quarters, at one time, to conceal home administrative mismanagement, by imputing the devastating sickness in the camp to professional ignorance of the ordinary rules of military *hygiène*. And be it further noted, that improvement in the health and condition of the soldiers in the field had begun, and the confusion and crowding in the hospitals had ceased, before the presence of any adventitious commission could have influenced the changes."

Sir John Hall's pamphlet bears exclusively on the latter clause of the passage just quoted. As chief of the Medical Staff in the Crimea, he has thought it his duty to vindicate for it a just share in devising and carrying out the sanitary measures taken early in 1855, whereby the general health of the army was then restored, and its efficiency maintained till the end of the war. He justifies himself for this procedure by reciting the pretensions, openly avowed and covertly implied, in certain speeches and reports wherein the whole credit of this result is given to the Sanitary Commissioners who visited the Crimea in April. The Inspector-General alleges that one of these gentlemen in particular has not been sufficiently ingenuous in acknowledging the sources whence he obtained much of the military information, and all the medical encouragement that made the services and presence of the Commissioners acceptable and beneficial to the army in the Crimea. We regret exceedingly that a controversy of this kind should have been provoked, however inadvertently. God knows, at one time the field of our toils and perils was wide enough for all labourers, military and civilian, in behalf of suffering humanity. We are thoroughly convinced that, in their several spheres, each did his entrusted duty to the uttermost of his abilities. In afterwards estimating opportunities and powers of doing good, Dr. Sutherland's name and services were, doubtless, unduly extolled by admiring friends in places where praise is more eloquent than if spoken on the streets. This can have happened without any fault of his. On the other hand, it is no libel to say, that the Army Medical Staff is undeniably the most sensitive body in existence in all that touches its rights, titles, and dignities. Hence the smart felt, and resentment uttered, at any implied disparagement of its professional qualifications for every duty belonging to it. For ourselves, with some *connaissance des faits*, we think that the Inspector-General imputes to the Sanitary Commissioners pretensions never entertained by themselves, when he impugns their conduct in the following protest :—" I owe it to my own reputation and position distinctly to state, that neither Dr. Sutherland nor any other member of the Sanitary Commission had anything whatever to do with either the organization or management of the military hospitals in the Crimea." We happen to know that the War-Office instructions given to Dr. Sutherland and his coadjutors expressly forbad their interference in matters of hospital organization and management, in the military sense of these words—and we shall want other evidence than what angry comment furnishes to convince us that these instructions were used as *lettres de marque*, whereby to seize the functions of, and sink the medical staff of the army into perfect ciphers in the hygienic transactions of the army before Sebastopol. Instead, therefore, of a pamphlet in self-vindication against exaggerated alarms, for the credit of the department, we should have been better pleased and more instructed if its distinguished Inspector-General had applied his experience and influence in showing to the Government the true causes of the comparative impotence of the military surgeon, and efficiency of the civilian ; co-operative when camp diseases—the acknowledged consequence, in this instance, of defective or unapplied hygienic resources—filled the hospitals with sick. It might have better become Sir John Hall's personal dignity, and certainly have conferred a desirable benefit on the medical staff, if the aim and burden of his reclamation had been to prove that imperfections and delay were not owing to ignorance of what was required under the circumstances, but that lack of power to carry out prophylactic and sanitary measures was alone blameworthy for all imputed defaults of his department. We should gladly have enforced in this place the just claims of the military medical officers to have, even now, enlarged authority granted to them by Government, to accomplish of themselves whatever their experience suggests useful for preserving the salubrity of camps, barracks, and hospitals. The civilian Commissioner was mainly potential in that he could, *proprio motu*, command labour other than military, and order payment. No similar privilege belonged to the army surgeon, whatever his rank. We all remember the astonishment felt by the Director-General himself on his being permitted to endorse, directly, certain charges on the Treasury for his department. No one can doubt but that if the Principal Medical Officer with the Crimean army had been empowered to order without circumlocution, and enforce attention to what he judged was proper for thoroughly ensuring and restoring the health of the troops during the first winter, that the foresight and intelligence of his staff would have proved all-sufficient for sanitary purposes. But while requisitions for the commissariat stores, and the smallest piece of engineering work, though signed by the Inspector-General of Hospitals, may be neglected or cast aside, as happened in numberless instances, it is unjust to make the medical staff alone answerable for things left undone.

Hence, we repeat it, our regret that Sir John Hall did not avail himself of the accepted provocation to write, in order to show Government that the greater the uselessness of the sanitary commissioners in carrying out measures already devised by the army surgeon, the more blameable an organization which could impose on him such like adventitious and accessory aid. If remonstrance on account of an illiberal appropriation by any person of "useful hints and information obtained from the army surgeons" was called for, true policy ought to have directed the charge against those who uphold a system which narrows the sphere and fetters the action of the army medical staff. The "exceptional powers with which the sanitary commissioners were invested," were assuredly not needed for the guidance of surgeons "who had spent their lives in camps and barracks;" but they were needed, and most usefully exercised, in bending the wills of other departments to the requirements of the medical staff.

Our purpose, however, in embracing Sir John Hall's pamphlet in this Review, is to refer to his testimony in confirmation of what we have said of the recuperative energies and self-directing action of the medical administration of the British army, compared with the absence of both these attributes in the French service.

This latter fact, in its bearing on the medical resources of our Ally at periods of great sickness in the Crimea, is fully demonstrated through the confessions and discoveries of the 'Mission Médicale,' and of 'England and France before Sebastopol.' To no part of his volume has Dr. Bryce given more conscientious care than to his description of the French ambulances and hospitals. There is no chapter whose perusal more impresses us with the ignorance, amounting to self-delusion, in which the English public—military, medical, political—existed, previous to its publication, respecting the real sanitary condition and means of the French army. No one can henceforth pretend to fulness and accuracy in narrating the conduct and conclusion of the war, till he has informed himself of what has been now revealed concerning certain of its material agencies and operations. The statements put forth by Dr. Bryce must either be accepted for their truth and application by the future historian of the Russian War, or the sanitary condition of an army and its hospital appliances shown to be things of no significance in military operations. It is not, however, in our power, in this place, to justify by sufficient quotations the estimate we have expressed of the historical and medical value of the author's testimony and experience. Nor do his descriptive writings admit of condensation. Only inviting our readers to study for themselves his official reports on the French hospitals on the Bosphorus, and his account of the ambulance huts at Kamiesch, we will anticipate a later portion of the volume than that here referred to, in order that it may be clearly understood what is exactly the proposition which he aims at establishing. It is, that—

"PEACE WITH RUSSIA WAS OBLIGATORY ON FRANCE IN THE SPRING OF 1856, BECAUSE OF THE SANITARY STATE OF HER CRIMEAN ARMY."

In the reports mentioned, and by other documentary and statistical evidence, Dr. Bryce makes known the local conditions, physical agents, and administrative defaults, by which the health of the French Crimean army was deteriorated, and its disintegration threatened. No one can read this part of his writings without finding it equally novel and instructive. He subjects to a process of strict logical discussion the problem—whether the agency of external nature, the general health of the French troops in camp, the normal condition of their sanitary means, were severally or collectively commensurate with the production of fatal results of the above-quoted national importance. As we have said, we cannot reproduce here the author's facts and arguments substantiating his proposition; only his summing-up is brief enough for quotation:—

"These four reports appear sufficiently comprehensive to show the true condition of the French general hospitals for some months preceding the close of the war. They have been selected from several others full of similar particulars, because the hospitals of which I speak* were considered the best furnished and administered. They are those, too, which English surgeons were taken to see *par préférence*, and, therefore, any exaggeration on my part can be exposed. The vast establishments at Daoud Pacha, Ramis-Tchiflic, Maltépé, Terrains des Manœuvres, each containing from twelve to fifteen hundred beds, remote from the track of medical visitors, seem to have had proportionally less military attention given to their cleanliness, crowding, and death casualties. In one of them the ratio of deaths to sick was above thirty per cent. for the month of February, and in that month the admissions were eleven hundred and forty-six from the Crimea and depôts at Daoud Pacha."

"Instead, therefore, of fatiguing my readers with more details of the condition, management, and mortality of the French hospitals at Constantinople, I shall restate my experience and judgment in relation to them generally.

"1. That two formidable epidemics—scurvy and fever—marked the beginning of the winter of 1855-56, both utterly ruinous to an army in the field, and one self-propagating to an illimitable extent whilst the circumstances in which it acquired its first intensity continued to exist.

"2. That the invasion of such an amount of disease at the above period was unexpected, and during several months continued unprovided for, as regards surgeons, hospital accommodation and furnishings, clothes, and other necessaries for the sick.

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* Hôpital de Pera; Hôpital de Palais de l'Ambassade Russe; Hôpital de Dolma-Batchi; Hôpital de Gulhanéh.

"That in these extraordinary circumstances, the forms and functions of the medical staff were as closely restricted *à l'art de guérir*, and on questions affecting the *hygiène* of the troops and management of hospitals as strictly subordinated to the *Intendance Militaire*, as they are at the Val-de-Grâce; by which means the destruction of the army was still further insured."*

Elsewhere it is stated that—

"Notwithstanding the great difficulties of his position, and the many administrative obstacles opposed to his professional labours, the French surgeon, I can affirm with equal truth and pride, does his duty to the hospital sick with an amount of zeal, courage, and self-sacrifice second to that of no other military officer. It was from no ignorance of the homicidal consequences of overcrowding, dirt, and want, nor lack of remonstrances against his destitution of all adequate and ordinary means of successfully combating the ravages of scurvy, and the other malign influences at work, propagating and intensifying a deadly fever, nor belief that one man's mental and bodily energies, however taxed, were equal to the bedside requirements of four, three, or even two hundred patients, that his manner of treating camp sickness, in ambulance and hospital, was unscientific to the eye of his English colleague, and its results on a level with his means." (p. 117.)

This eulogium on the French Medical Staff, which we gladly transfer to our pages, reminds us that in his several points of comparison between the English and French hospital services, Dr. Bryce has only incidentally alluded to the relative merits of each as regards insuring the highest quality of bed-side attendance for the sick soldier. We could have wished that this observer had, in his capacity of Civil Physician, given to the profession his experience and opinions on this paramount particular. Better still, if he had furnished facts applicable to the improvement of ourselves; for it were sheerest prejudice to suppose that there was nothing to learn or adopt from French medical administration. For ourselves, we have only encountered one Chathamite *P. M. O.*† who sturdily upheld the absolute wisdom and excellence of the English system throughout all its details. As we happen not to share in this good old Tory notion, and had the advantage of seeing a good deal of the military hospitals in the Crimea, and on both sides of the Bosphorus, about the period to which Dr. Bryce's observations refer, we will try briefly to eke out his information.

We are, then, of opinion—

1. That the present *regimental* hospital system insures to the sick in camp and garrison an adequate amount of skilful, regular, and responsible medical attendance—excellent drugs, proper nursing, a liberal and varied dietary, and every other essential means for their recovery.

2. That it is an imperfection in general hospital management, where the sick have not the direct clinical services of its superior Medical Staff.

3. That it is highly desirable to engraft upon our *general* and *garrison* hospital administration the advantages which the French sick soldier derives from the usually greater age, maturer experience, and higher rank of his *médecin traitant*, compared with the English prescribing attendant.

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* England and France before Sebastopol, pp. 59, 60.

† Principal Medical Officer.—Editor.

4. That to the unity and relative independent action of the English army medical department—its Chief communicating directly with the War Minister and head of the army—are mainly due the extraordinary sanitary condition of our troops in the Crimea, and the perfect state of preparation at Scutari against disease, during a lengthened period, when the French army was reduced three-fourths in numbers and efficiency by camp sickness, hospital destitution, and the failure of its medical administrative resources. The grounds of these several opinions will be frankly stated—thanks to the impenetrable *we*.

1. With reference to regimental hospital service and sick management, all our observations and reflections are favourable to their efficiency. In our judgment, the daily routine of medical duties, the means available and measures taken for their due performance in our regimental hospital tents and huts in the Crimea, insured to the sick and wounded ample and excellent professional attendance, abundance of genuine medicines carefully dispensed—a suitable dietary, including *extras* and comforts—trustworthy orderlies—frequent changes of body and bed clothes—cleanliness, quiet, and regularity. Except as regards the winter of 1854–55 (when the medical department no doubt suffered from the general uncertainty and miscalculations respecting the scenes and magnitude of hostilities to be engaged in), we never heard a surgeon complain of the want of appliances for the proper treatment of patients. On the contrary, all with whom we have closely discussed the point expressed themselves contented.

It may, therefore, be fairly concluded that, in all things relating to the personal comfort and medical treatment of sick, the English soldier under the charge of his regimental surgeons was well cared for. Under ordinary circumstances, the regimental surgeon retains charge of the sick and wounded of his corps. In his hospital marquee, a division of labour, unity of action, and certainty of results, are available instantly for the requirements of patients; towards which end purveyors' and apothecaries' stores are open to his requisitions, both being under exclusive medical control. Further, the English surgeon feels that, while his hospital duties are discharged under strict safeguards against waste and misappropriation of public property, he is not subjected to such modes of minute accounting for the receipt and expenditure of drugs and articles of extra diet as undisguisedly implies mistrust of his personal integrity. Lastly, he understands that his promotion is mainly influenced by the opinion entertained of his services in his own department. His military position, therefore, in all essential respects, is one becoming a surgeon and a gentleman.

But the English system is not designed for the special advantage of the Medical Staff. It, above all, enables the soldier in hospital to command the exclusive solicitude of his regimental surgeon; and thus, while the latter benefits in a medical sense by knowing the man's previous habits, constitution, and character, the former feels he can confide in the sympathy and protection of his *own doctor*. The French system differs in every particular enumerated; and in this difference implies, as we think, inferiority. We have invariably heard intelligent French surgeons speak with admiration of the greater power of usefulness possessed by the English regimental surgeons, and which they ascribed equally to his better military position, and to his larger freedom from unprofessional interference in respect of purely medical questions. Mainly to the differences in the respective systems they traced these two grand results—that in the British camp before Sebastopol, during many months the regimental hospital marquees were almost empty, and the occupied beds presented only cases of ordinary sickness; while the French *ambulance* service, provided for sixteen thousand sick, had the floors of its huts and tents overcrowded with sick, labouring under the most malignant forms of camp sickness.

The opinions Nos. 2 and 3 (to which we beg to refer back) had their origin in the very remarkable difference found to exist in the military rank and professional *status* of the surgeons in charge of patients in English and French hospitals on the Bosphorus. We confess that, on our visiting the Scutari establishments in the first months of 1855, we were surprised to find that the real clinical attendant, and directly responsible medical prescriber for the numerous sick, was an assistant or acting assistant-surgeon. To him was intrusted indiscriminately the dressing of a gun-shot wound, the diagnosis of scurvy, and treatment of dysentery—diseases for the first time seen by him—the time and attention of the divisional surgeon being fully occupied with other official duties. Our longer experience and close observation of the organized division of labour and appropriation of duties in these military hospitals, failed to remove our objections to this part of the English military system. We appreciate the great improvement in medical teachings and studies within the last thirty years; and acknowledge the superior collegiate attainments of the present generation of practitioners; nor did the youthful hospital medical staff discredit the care and judgment exercised in their selection. But the interests of science and humanity compel us to give the preference to French hospital organization, as regards the qualities of the officer in direct responsible charge of patients. The *médecin traitant* is a surgeon who has passed two years, at least, as *sous-aide*, and an indefinite number more as *aide major* in garrison or ambulance service, before he was entrusted with the responsible care of the sick. Hence it is very rare to see a surgeon, *cahier* in hand, undecorated. It is only under pressing exigencies of the service—such as was the case in the hospitals on the Bosphorus, in the winter 1855-56—that a medical officer under the rank of *Chirurgien de 2de classe*, was employed as *médecin traitant;* but even then few *sous-aides* had charge of sick; and it delighted us to see every higher grade, up to *chef-d'hôpital*—equivalent to deputy-inspector—doing the ordinary duties of assistant and acting assistant-surgeons. Thus, M. Thomas, Médecin-en-Chef, exercised the self-imposed duties of *médecin traitant* at Gulhanéh, for the purpose of acquiring experimental knowledge of the nature and treatment of Crimean camp diseases brought into the hospitals generally.

Whence it appears that the rule of the French service is for medical men of ranks corresponding to those of second and first-class staff surgeons and deputy-inspectors in the English, to prescribe for and diet the sick, while they also perform the superintending hospital duties of the latter.

There may have been advantages which we failed to comprehend in the English hospital system as practised at Scutari, where the divisional surgeon looked chiefly to the accuracy of the diet lists, the order and cleanliness of the wards, and limited his purely medical functions to passing invalids and performing capital operations. But, in our ignorance of good reasons for this manner of distributing medical duties, we must unhesitatingly give a preference to French hospital administration in this important particular. When accompanying the *cliniques* of Cambay, Cazalas, and Lüsterman, men of European reputation, one was constrained to acknowledge the satisfaction which the French soldier in sickness derived from knowing that all would be done for his recovery that practical sagacity and mature experience, the fruits of many years' clinical practice in various climates, could accomplish. Youth and inexperience were too conspicuous at Scutari to inspire similar confidence.

This difference in the attributes of the two medical services is perhaps still more manifest in another scene and later period of their respective labours. According to the English system of military promotion, the medical life of the army surgeon may be said to cease on his attaining a certain position on the Staff. Unobliged officially to give much thought to pathology and therapeutics, he rarely advances in knowledge of either by subsequent self-imposed study. And hence, it may be, a cause of the few distinguished contributions made to medical science by army surgeons, either during the period of service or after retirement. The French army surgeon, on the other hand, knows and shows that he owes much of his personal standing and military promotion to the estimation in which he is held for professional attainments. Whence his ambition and reward. He cultivates pure medicine, and exalts operative surgery, making present opportunities subservient to advancement in military rank, and future private practice. Besides, numerous professorships, military and civil, and other desirable appointments, are open to his attainment by *concours*, to which the rules of the service contribute by allowing permanent retirement before bodily and mental energies are exhausted.

We have thus pointed out the only inferiority or fault which we discovered in our hospitals on the Bosphorus compared with the French. In every other organic principle and administrative detail, we do conscientiously consider that the advantage is on the other side. Beside personal experience, we have the testimony of competent judges on the workings of both systems. And assuming for a standard and test of comparative efficiency the state of the hospitals under the severest pressure of adverse circumstances which both encountered, namely, crowded wards and scarcity of surgeons, we found the English organization—embracing in one whole the medical, purveyor, and apothecary departments—to possess a facility and comprehensiveness of adaptation to meet unexpected wants and altered conditions which were not shown to belong to the French. There can exist no doubt of the fact that, in the winter of 1855-56, the faults and deficiencies of the French hospital service caused the loss of several thousands of lives to the army.

In opinion No. 4 is comprehended and condensed what appears to us the true explanation of the extraordinary difference in the sanitary state of the English and French armies towards the close of the war. Dr. Bryce traces this difference in a great measure to the administrative power and functions of the *intendance militaire* in French hospital management. A *sous-intendant*, or even *l'officier comptable*, grants or withholds at his sole pleasure medical requisitions for hospital furniture and sick comforts; and mulcts the surgeon in the cost of any deviation from the diet-table: while the *pharmacien* can cast aside any prescription not strictly conformable, in name or contents, to a most narrow formulary. But, worse than all, the chiefs of his own department cannot recommend an hospital surgeon for promotion, except "*sous la réserve de l'acceptation du sous-intendant militaire chargé de la police administrative de l'établissement.*"[*] To the surgeon is, indeed, entrusted whatever may be rigorously interpreted to appertain *à l'art de guerir*, but he has only a consultative voice in all other hospital concerns. For instance, the *médecin traitant* may represent the desirableness of increased hospital accommodation—separation of one class of diseases from another—renewal of bedding—purification of a ward, or removal of an orderly—but neither he nor the *chef-d'hôpital* can do any of these things *proprio motu.*

Inasmuch, therefore, as the medical service and hospital administration of the English army differ in these particulars from the French, so is its superiority as regards the respectability and usefulness of the military surgeon.

4. With all these drawbacks, then, sanitary, administrative, moral, and material, on the part of the French, what was the military effectiveness of the Allied combatants immediately previous to the signature of peace?

By a scrupulous, and possibly a tiresome, statement of facts and course of reasoning, we have advanced ourselves and readers to this question—the chief end of the present Review. For without encroaching on the province of political publicists, we are permitted to discuss the causes which determined peace with Russia, so far as these can be best apprehended through medical science. It is especially from this point of view that the author of 'England and France before Sebastopol' has looked at the abrupt close of the Russian War. He casts a new light on some things hitherto obscure. For instance, it has been surmised that the termination of hostilities was for the Emperor of the French a political necessity. As to the precise causes, however, in which that necessity had its source, there has been a good deal of obscurity, owing to the reserve, authoritatively imposed, in France. The English public was almost as much in the dark; and we doubt if Government was more enlightened on this subject than the public. Until the explanatory elucidations of the volume named, no one dreamed how much the counsels and reports of the army surgeons had to do with the hurried proceedings of diplomatic agents: we little knew that the Paris Conferences had their origin, mainly, in the sanitary state of the French army and the camp diseases which were threatening its utter destruction.

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[*] Vauchelle, tome premier, p. 387.

No intelligent reader who has thoughtfully accompanied us in the preceding narrative can doubt that military hygiène, in other words, the medical facts of the war, regarded in their relation to the pacific issue of hostilities, exercised an influence which has hitherto not been sufficiently acknowledged either by the diplomatist or physician. The nature and extent of this influence Dr. Bryce applies himself to unfold in his chapter on the "Military Effectiveness of English and French Armies at the close of the War." He contrasts the belligerent conditions of the English and French armies in the winter of 1855-56. As respects the former, Dr. Bryce has a very striking passage, and as it happens, at the same time, to exemplify the author's style, we will lay it before our readers:

> "It will be remembered that, England and France having declared war against Russia in March, 1854, 25,000 British and 23,000 French soldiers landed on the Crimea in September. Passing over, with a sad, proud retrospect, the purely military events of the first year's campaign, I desire to point attention to the fact that '*the thin red line*' which tipped the heights of Inkermann in November, 1854, had, in March following, acquired a breadth and solidity that displayed the will and might of England for the continuation of the contest. Losses by death had been amply supplied, local causes of disease totally removed, sufferings from excessive hardships and privations ceased to be, the consequences of incomplete or divided responsibilities corrected, so that, in September, 1855, fifty thousand British troops of all arms were encamped before Sebastopol, surrounded with every possible comfort, abundant food, sufficient shelter, and excellent clothing. . . . . It was then and thus England and her soldiery rose to the elevation of conscious strength, expectant triumph, and the old feelings of 'pride of place,' in the presence of foes and friends alike.
>
> "But, conspicuous above all other evidences of the warlike efficiency of the British army was the capital health we have seen that it enjoyed throughout the winter of 1855-56. At the front, the regimental and general hospitals contained so few patients, that Dr. (now Sir John) Hall, Inspector-General, in reply to applications from surgeons to proceed thither for service, stated he had not enough employment for a moiety of those already present. . . . . On the Bosphorus, Kulalee had been given up in part to Sardinians, and was otherwise occupied by a portion of the German Legion. Scutari's magnificent hospitals presented a couple of miles' length of corridors entirely vacated of sick, many wards closed, and those still open had more empty than full beds; while the diseases under treatment had no speciality depending on climate, camp-life, or state of warfare. At Renkioi the medical chief, Dr. Parkes, and staff could only point expectantly to the great capacity and admirable arrangements for the reception of sick. Medical men abounded so much in excess of all requirements for their own sick, that ten of their number were allowed to volunteer to do duty in the French hospitals on the Bosphorus.
>
> "And, more significant still, and illustrative of the great improvement which had been effected in the soldierly *morale* of the British army, was the altered feeling of the sick at Scutari in respect of rejoining their colours. Whereas, in the spring and summer of 1855, men craved to be invalided for England, and to enforce it had recourse to various pitiable contrivances in order to pass

a board, now, the care and experience of the surgeons were engaged to moderate the martial ardour of convalescents. Hence, it happened that in the spring of 1856 the sympathies of the people of England were not warmer in support of a war expenditure, than was the heart of her soldiers to confront its perils.

"And yet, at the height of these English hopes, resolves, and reasonings, and in spite of complete preparedness to enter upon a third year's campaign, a suspension of hostilities was covenanted in February; in March peace was concluded, and in England uproariously proclaimed, with the port of Sebastopol still in possession of the enemy, with his power somewhat broken, it may be, in the Black Sea, but by no means impaired by any material concession made as the price of peace;—while the traditional policy of Russia remained uncompromised within, unfettered beyond her own dominions; and the *prestige* of her power was placed higher than ever throughout Asia."[*]

How gloomy the picture placed beside this is the succeeding one drawn by the same hand. First, respecting the great mortality in the French camp—

"We are informed of the physical and moral conditions by which all exposed to their influence were predisposed to sickness; next, we have described to us abodes for the use of the healthy so vitiated as to have become prolific hot-beds of fever; and, third, we find the receptacles allotted to the sick destitute alike of means and hope of cure—nay, worse, themselves charnel-houses which had to be destroyed for the safety of the sick attendants."

Again, it is observed that the—

"Warlike strength of an army may be not less surely judged of by an inspection of its general hospitals in the rear, than of its paraded battalions before the enemy. Let the practised eye of the surgeon only glance at the state of the wards, note the proportion of occupied to vacant beds, mark the character of the prevailing diseases, observe the general appearance of the convalescents, and the Minister for War may rely on his sagacity to be rightly informed with respect to the probable ratio of deaths, of invalids unfit for further service, and of convalescents soon to rejoin their colours—proportions and particulars bearing importantly on the effective field force to be maintained. It is told of Lord Raglan, that it was in scrutinizing the weekly sick returns from Scutari, in the first winter, he complained how rapidly his army was melting from before him."[†]

What, then, must have been the sentiments of General Pélissier when he read the following official return of the French hospitals on the Bosphorus?—

"*Mouvement général des maladies traités dans les hôpitaux de Constantinople, pendant Janvier, Février, et Mars*, 1856.

	Totalité.	Fièvrieux.	Typhus.
Janvier	13,520	11,048	—
Février	21,309	19,740	3,489[‡]
Mars	18,167	16,878	3,748

"DEATHS.—*Decade* ending 20th March:—Number of sick under treatment for all diseases at that date, 11,366; number of deaths in preceding ten days, 1009.

"*Decade* ending 30th March:—Number of sick under treatment as above, 9763; number of deaths for ten days, 948.[§]

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[*] Op. cit., p. 20 et seq.

[†] Op. cit., p. 36.

[‡] "This denomination first used officially in these hospital returns."

[§] Op. cit., pp. 97, 98.

These numbers establish a great mass of sickness in relation to an army circumstanced as we have seen the French was in the Crimea. But, while the sickness was formidable in amount and deadliness, it was also unquestionably contagious, in the ordinary sense of the term. M. Baudens frankly avows—

> "That the invasion of typhus in 1855 proved the greatest disaster and worst trial which the French army encountered during the Eastern expedition; he says that it constituted in February *one-fifth* of the whole sickness, amounting to forty thousand cases in hospitals at the front and on the Bosphorus; of which one-fifth, or eight thousand patients, he declares, '*les deux tiers étaient voués à une mort certaine.*'

There was here an accumulation of many great evils. Forty thousand sick at one time, disproportionate mortality, scarcity of medical attendants and sick comforts. But, overwhelming all these was the existence of febrific pollution. M. Baudens unhesitatingly proclaimed and acted upon the essentially contagious property of the camp fever.

> " 'Il s'agissait de déployer des mesures énergiques, sans quoi la mortalité eut été sans limites.' He made known to the Emperor, through the Minister of War, 'dans quelle situation critique l'invasion du typhus place l'armée d'Orient.' Again, referring to the same period—February—and circumstances, the same authority exclaims, 'Nous étions menacés d'un véritable et affreux désastre.' "*

Another French officer, quoted by Dr. Bryce, speaking of this conjuncture, declared that "*cette armée aurait certainement péri toute entière s'il avait fallu lui faire faire quelques marches en Crimée.*"* Dr. Bryce argues, moreover, that—

> "Instead of proving auxiliary and contributory to the strength of the French forces, the entire hospital system had become a source of weakness, daily deepening, illimitable, irremediable."

And he concludes that

> "War for the French army on the actual *terrain* had consequently become not more difficult on account of its general sanitary state at this time, than impossible with this hospital provision for its casualties. To this result the utter prostration of the Medical Staff by death, disease, and disproportionate duties, had already contributed its significant share. Forty-six surgeons had died from typhus alone. Scarcely one escaped an attack. There was fear lest the sick would be left utterly without skilled help; while the Minister of War, implored to send out as many surgeons as possible, declared his inability to furnish any from France, because '*Il n'en avait plus à sa disposition, et le recrutement ne répondait pas aux besoins.*' "—(Baudens.)†

Let these facts be marshalled by the side of our English experience, and they speak for themselves, rendering comment superfluous.

Without, therefore, taxing further the patience of our readers and our own space, we will reproduce the summing-up of Dr. Bryce on this part of his subject:—

> "From these premises, stated and reasoned upon in the spirit of completest fairness, I venture to deduce the following conclusions:—

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* Even if M. Baudens had not written with the natural reserve of a Frenchman, his evidence must be qualified by the deference due to his military superiors; and yet, how full of meaning are these few lines.

† Op. cit., p. 89.

"1st. That whatever the muster-roll numbers of the French army in March, 1856, its efficient belligerent strength was then reduced below fifty thousand of all arms, inclusive of the troops at Eupatoria.

"2nd. That at this period a devastating disease abounded in the camps, under circumstances which inevitably tended to enlarge the sphere and hasten the course of its natural destructiveness, and, consequently, to reduce with fearful rapidity the remaining strength of the army.

"3rd. That, concurrently, the Medical Staff and hospital sanitary resources of the army had become almost unserviceable.

"4th. That these evils were irremediable in the presence of an enemy, and incompatible with the immediate prosecution of the war.

"5th. That from these several and united causes, the French army had ceased to hold the foremost place among the Allied forces in respect of numbers, equipment, and power of mobility.

"Whence it follows, in my opinion, that apart from and above all other political considerations, peace had become a State necessity for France and her present sovereignty. The country must in time have learnt something of the inglorious losses of the army, and might have shown discontent at frequent conscriptions and fresh loans. The Emperor having well served his dynastic purposes in the war, and fearing to face the eventualities which a prosecution of the Russian contest might have produced, from diminution of military glory, resolved wisely to make the capture of the Malakoff, and consequent fall of Sebastopol, his justification to the nation for the issue of the Peace Conferences at Paris."*

Postscript.—Whilst the proofs of this Article are under revision, Dr. Scrive's 'Relation Médico-Chirurgicale de la Campagne d'Orient' has reached us from Paris. Evoked, as impliedly this semi-official publication is, by the statements and arguments put forth in 'England and France before Sebastopol,' we are pleased, on a rapid glance over its tabular returns and *pièces justificatives*, to perceive that in no important point do these invalidate the accuracy or impugn the fairness of the English author. On the contrary, excepting always the latter's political conclusions, M. Scrive's bulky volume reads like a commentary on a text to be found in the third chapter of Dr. Bryce's revelations.

REVIEW IX.

On Epilepsy and Epileptiform Seizures: their Causes, Pathology, and Treatment. By EDWARD H. SIEVEKING, M.D., Fellow of the Royal College of Physicians, Physician to and Lecturer on Materia Medica at St. Mary's Hospital.—*London*, 1858. pp. 267.

OUR readers are probably for the most part aware of the intimate relation existing between the book whose title is given above, and the editor of the 'British and Foreign Medico-Chirurgical Review.' They will, therefore, not expect that we should offer them any criticism upon the work. We do not possess the amount of self-denial necessary to admit an article unfavourable to the author's views, while we are too jealous of the reputation of the Journal with which we are identified, to allow even the shadow of a suspicion of partiality by permitting the appearance of a favourable Review.

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* Op. cit., pp. 93, 94.

We conceive, however, that the most fastidious sense of justice cannot be hurt if we lay before our readers a brief sketch of the contents of the book, hoping, we freely confess, that many may read it, and form, if possible, a favourable opinion regarding its merits.

The work is divided into ten chapters. In the first three, after some brief introductory remarks on the general relation of the epileptic fit to the intervals, a description of the former is given, followed by a detailed analysis of the individual symptoms characterizing the paroxysm, with an examination of their relative value.

The fourth chapter is devoted to the consideration of the phenomena observed during the intervals of the complete epileptic seizure. The author is of opinion that more attention should be paid to the free intervals than is commonly done, and strongly urges the necessity of not separating the epileptic paroxysm from the intervening periods, in forming our estimate of the disease.

In the fifth and sixth chapters, the causes and complications of epilepsy receive special attention. The frequency of epilepsy, as influenced by climate, race, locality, and sex, are investigated. The bearing of hereditary influences, the relation which the affections of the thoracic and pelvic viscera and other disorders may have upon epilepsy, are successively examined. The physical and mental influences which are ordinarily classed together as exciting causes, and their relation to what are regarded as predisposing causes, are discussed in the sixth chapter, in which, as throughout the work, the author illustrates his view by reference to statistics and to cases which he has himself observed, as well as by drawing largely upon the literature of this and other countries.

The pathological anatomy of epilepsy next engages Dr. Sieveking's attention. He passes in review the observations of the most distinguished authors who have written on the subject, and dwells at some length on the investigations of Professor Wenzel and Dr. Boyd. The author concludes, that, so far as it is possible to trace a connecting link between the results of different observers, the evidence is in favour of a peculiar state of mal-nutrition of the brain, probably allied to chronic inflammation, constituting the *causa proxima* of the disease. Without going more minutely into detail than it is our purpose here to do, we cannot dwell upon the various facts and arguments brought forward. The same applies to the contents of the eighth chapter, in which the theory of the disease is discussed. The doctrines promulgated by various authors first receive attention; the author sides with those who place the seat of the disease in the brain, and he regards "an irritation produced by derangement in the amount or quality of the blood circulating in that organ" as the efficient cause, especially in first attacks. The chapter concludes with an investigation of the relation existing between epilepsy and other diseases of the nervous system, especially those of a spasmodic character.

The subject of treatment, to which the concluding two chapters are devoted, is divided into two heads; the purely medicinal, and the dietetic and regiminal treatment. As Dr. Sieveking seeks for an explanation of the phenomena of epilepsy in definite pathological conditions, and argues that all the varieties of the disease are essentially identical, though modified by the pathological and etiological relations that accompany it, he concludes that the treatment must vary with these different circumstances. The author discards the idea of a specific treatment, and insists upon the necessity of a rational procedure.

It would be useless to go into the details of the views entertained in this matter without at once reproducing more fully the statements and arguments contained in the earlier chapters, upon which the former are necessarily based. We may, however, observe, that without maintaining the propriety of an uniform system of treatment, the general experience of the author has been to the effect that local derivation from the brain, with general medicinal and regiminal treatment of a tonic character, was that most suited to the patients he had had to deal with. Dr. Sieveking guards himself against being supposed to advocate exclusively any one method of treatment, and is of opinion that our knowledge of pathology and the varying types of disease, occurring in different localities and at different seasons, justify our accepting the statements of older as well as recent authors, who maintain that they have obtained complete cures by methods differing widely from that which is commonly pursued by himself.

We sum up the views which the author entertains regarding the pathology and treatment of epilepsy in the following terms:

The disease consists in a fundamental derangement affecting the parts of the mesocephalon, and probably the entire brain; intimately allied to the mal-nutrition dependent upon chronic and degenerative inflammation, which, on the application of a given stimulus to the brain, allows of the paroxysm. The stimulus may act directly or indirectly upon the brain (centric or eccentric causation), but the disease in all cases is essentially the same. The treatment consists mainly in counteracting the mal-nutrition spoken of, and as the symptoms may be, as in other diseases, of a more or less sthenic type, the treatment must vary accordingly. The author has himself met with the disease mainly, but not invariably, under circumstances indicating a low vitality; but he is satisfied, even from the variations which have occurred to his own observation, that considerable differences in the mode of treatment may be demanded in different individuals. The author's treatment, if it is necessary to formularize it, consists in employing frequent and continued counter-irritation and other local means calculated to restore a normal state of the intracranial circulation; while he seeks to counteract the mal-nutrition, which he regards as the fundamental basis of the disease, by medicinal and regiminal tonics of various kinds; at the same time, he urges the necessity of correcting any disorders which may coexist in other organs, and, by the additional tax upon the constitution, tend to promote the disease. With these brief remarks we must leave the book to its fate, but we may conclude this notice by the following observations, which we take from the preface:

"The very fearful nature of the disorder, the strange and violent symptoms that characterize and almost seem to remove it from the domain of ordinary diseases, constantly attract new inquirers, each anxious that he may succeed in lifting the veil that shrouds the mystery. No individual, however, can expect to do this; but each may in his sphere seek to aid in its ultimate removal; and in this hope I have not shrunk from devoting much labour and time to a subject promising so little reward.

"The labour has been a labour of love; nor has it been undertaken without a full sense both of the difficulties in the way of the inquirer, and of the dangers of dogmatism and empiricism besetting his path."

Review X.

1. *Medical Statistical Returns of the Baltic and Black Sea Fleets during the years* 1854 *and* 1855. Ordered by the House of Commons to be printed, 27th February, 1857.—pp. 115.
2. *Notes on the Cholera at Varna in* 1854, *and more especially in her Majesty's Ship* Agamemnon, *in the Black Sea, between the* 1*st August*, 1854, *and the* 8*th September*, 1855. By George Mackay, M.D., &c., &c., Staff-Surgeon Royal Naval Hospital, Plymouth, late Surgeon of her Majesty's Ships *Bellerophon* and *Agamemnon*. —*Edinburgh*, 1857. pp. 43.

The Medical Statistical Returns of the fleets engaged in active service during the late Russian war form an interesting and important addition to former papers on the health of the navy. Although partially marred by the intermingling of loose views and vague assertions with its legitimate object as a record of facts, the document is both able and instructive. As it is quite impossible to give anything like a complete abstract of its contents in the space at our disposal, we must be content to select some of the more important facts, and refer our readers to the original for details. The number of cases of sickness in the Black Sea fleet for each thousand of mean strength was 1638·5 in 1854, and 1308·9 in 1855. The number in the Baltic fleet was 1508·2 in 1854, and 1272·9 in 1855, also for each thousand men. The mortality per thousand in the Black Sea fleet was 54·2 in 1854, and 34·7 in 1855. By far the greatest portion of the deaths arose from disease. Wounds and injuries only caused a mortality of 9·1 in the thousand in 1854, and 8·4 in 1855; whilst the deaths from disease amounted to 45·1 in the former, and 26·3 in the latter of these years. The death-loss in the Baltic fleet was less than half as much as that sustained in the Black Sea fleet, only 19·4 men having died out of each thousand in 1854, and 11·4 in 1855. Including deaths by drowning, only 4·2 in the thousand died from violence in the first, and 3·1 in the second year of service.

The mortality in the Black Sea fleet was chiefly caused by fevers and diseases of the alvine flux character—including cholera, dysentery, and diarrhœa under this denomination. The deaths from fever were nearly equal in the two years, being computed at 3·8 in the thousand in 1854, and 3·9 in 1855. Cholera, diarrhœa, and dysentery conjointly occasioned 33·1 deaths out of each thousand of the living in 1854, and 11·1 in 1855. The fever death-rate in the Baltic fleet was 1·1 in the thousand in 1854, and 1·0 in 1855. Cholera, which caused 108 deaths, being at the rate of 6·2 in the thousand in the first year's campaign, was only fatal to 3 persons in the following year.

The principal diseases in the Black Sea fleet were fevers—including ague and remittent fever—influenza and catarrh, cholera, diarrhœa, and dysentery, rheumatism, and phlegmon. About one person in fourteen appears to have suffered from rheumatism in the Black Sea fleet, and one in ten in the Baltic, during the two years. Phlegmon and abscess were extremely common in both fleets—nearly a fourth of the men forming the force in the Baltic having suffered from affections referred to this head, and more than a sixth of those in the Black Sea. The mortality from these diseases was in either fleet most insignificant. Fatal cardiac complications of rheumatism appear to have been rare, as only 19 deaths occurred from affections of the heart in the Black Sea, and 10 in the Baltic. The deaths from disease of the heart in the Baltic fleet were equally divided between the two years. In the Black Sea fleet the deaths from the same cause were more than twice as many in the second year as in the first, as though some of the persons damaged by rheumatic affections of the heart in 1854 had died in 1855. Jaundice was rather common in both fleets, but more prevalent in the Black Sea than in the Baltic. The disease appeared in groups, as if peculiarities of diet or of weather had been its exciting cause. Fevers were much more prevalent in both years in the Black Sea than in the Baltic fleet. They were also much more fatal. One person in 16 suffered from fever in the Black Sea fleet, and 1 case in 16 was fatal; only 1 person in 39 suffered from fever in the Baltic fleet, and of those that did suffer rather less than 1 in 23 died.

Sickness fell with unequal severity upon the different vessels. Cholera fell most heavily upon the *Britannia*, *Trafalgar*, and *Albion* in the Black Sea, and was all but exclusively limited to the screw line-of-battle ships in the Baltic fleet. There were but two cases in the five line-of-battle ships belonging to that fleet which were not steamers, although it would seem that these vessels had the same communication with infected ports as those that suffered from the pestilence. In the Report to Lord Panmure of the Sanitary Commission to the seat of war in the East, Dr. Milroy, one of the Commissioners, speaks of the sanitary arrangements on board *screw* line-of-battle ships as being in several respects defective; the amount of space, both for the sick and well, is too limited; the ventilation is most imperfect, the air of the sick-bay, in particular, being vitiated by the faulty arrangements of the water-closets and the offensive effluvia arising from the men's latrine.* How far these defects had to do with the limitation of cholera in the Baltic fleet to this class of vessels we do not venture to say. Intermitting fever of course was worst in those vessels which laid nearest to marshy shores. The attacks of continued fever were of a low asthenic character, and the cases on board the *London*, in the Black Sea, which were also unusually numerous, were complicated with pneumonia. The same vessel was remarkable for the tendency of every wound and abrasion, however slight, to degenerate into unhealthy ulceration. Late in the first autumn, erysipelas also made its appearance on board the *London*, but was checked by discontinuing the practice of wetting the decks. The *London*, the *Royal Albert* excepted, was the unhealthiest vessel of its class in the fleet. Although her crew were employed in precisely the same localities and the same duties with the other vessels, there was a larger proportionate number of cases of ague among them. The *Queen* and *Rodney*, which were the healthiest ships in their fleet during the first year's campaign, retained their pre-eminence for salubrity in the second season. The *James Watt* had an average of only 2·6 in the thousand of numerical strength non-effective in the two Baltic campaigns, whilst the *Majestic* had an average of 8·7 in the thousand non-effective in 1854, and 5·1 in 1855. The *Rosamond*, formerly well-known as the *Eclair*, formed one of the Baltic fleet in 1854, and had an unusual number of fever-cases among its crew. The surgeon reports, that

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* Report to the Right Hon. Lord Panmure, G.C.B., &c., Minister at War, of the Proceedings of the Sanitary Commission dispatched to the Seat of War in the East, 1855–6, pp. 235–8.

> "The fever was generally of a low kind, and the exacerbations took place towards evening. There is no doubt that the fever was altogether different from the ordinary fever of temperate climates, and that it was produced by different causes. I am strengthened in this belief by the fact that a man who was employed in clearing the space under the magazine, which is before the engine room, was seized by fever on the following day. Several other cases occurred in men who had been employed in cleaning the bilges. There was a considerable quantity of filth found under the magazine; how it occurred, or how it escaped notice so long, or what led to its discovery, I am unable to state."

Cholera is spoken of, both in the 'Statistical Returns,' and also in Dr. Mackay's brochure, as a contagious disease. The latter book, indeed, appears to have been written for the purpose of placing the evidence in favour of contagion afforded by the history of the cholera at Varna and in H.M.S. *Agamemnon*, before the profession. Dr. Mackay's opinion previously was that contagion had little or nothing to do with the propagation of cholera, but the facts he witnessed whilst on service in the Black Sea gradually altered his opinion. The facts related by Dr. Mackay are well told, and in themselves most interesting; but in our opinion neither the facts related by the Doctor, nor those mentioned in the 'Medical Statistical Returns,' throw any fresh light upon this much disputed question. We should like to have placed the more important of these facts before our readers, and also to have referred to the health of the Royal Naval Brigade in the Crimea, to Dr. Smart's communication on the unhealthy inflammation affecting stumps soon after amputation, which is embodied in the 'Statistical Returns,' and to the many interesting and important surgical cases that are also therein related, but that anything like a complete notice of them would be impossible.

REVIEW XI.

Die Einflüsse der Vaguslähmung auf die Lungen und die Hautausdünstung. Von G. VALENTIN, Professor in Bern.—*Frankfurt-am-Main*, 1857. pp. 157.

The Influence of the Section of the Pneumogastric Nerves on the Pulmonary and Cutaneous Transpiration. By PROFESSOR VALENTIN. 1857.

THE object of the monograph of Professor Valentin is to point out the immediate influence of the pneumogastric nerves on the mechanism of respiration, and the secondary effect on the chemistry of transpiration.

Although the experiments performed have been almost entirely limited to one species of animal, and are far from being numerous, the uniformity of the results, as the author remarks, may yet be accepted as sufficient proof of their exactness. The little volume may be said to comprise a description, firstly, of the manner in which the experiments were conducted; secondly, of the normal condition of the animals before being operated upon; and lastly, of the effects following the injury to the nerves. At present we shall give but a brief sketch of the manner in which Valentin performed his experiments and the results he obtained, as we purpose on a future occasion to recur to this subject, which appears to us of considerable value, when taken in connexion with the chemistry of the breathing process.

Valentin's method of research was as follows. A healthy rabbit, whose weight and temperature of body had been previously ascertained, was placed in a tightly-closed box containing 28,142,4 cubic centimètres (1804 cubic inches) of air. The temperature of the confined atmosphere was moderated by placing the apparatus in another box containing cold water, and measured by a thermometer inserted in the lid. To the apparatus were attached a manometer to ascertain the pressure, and consequently the increase or decrease in volumes of the enclosed air, and an eudiometer to receive a portion of the gas for analysis after the experiment was completed. One of the sides of each of the boxes being made of glass, the number of respirations could be counted during the animal's confinement, which generally lasted upwards of sixty minutes. On the rabbit's removal from the apparatus, it was again weighed, and its temperature noted. The air collected in the eudiometer was next analysed, in order to estimate the quantity of oxygen consumed and of carbonic acid exhaled by the animal, during the time of its sojourn in the box. The amount of aqueous transpiration from the lungs and cutaneous surface of the rabbit was determined by the loss of weight of the animal: the difference depending upon the amount of oxygen absorbed and carbonic acid exhaled being taken into account in the calculation.

We need scarcely observe that this method of research is open to many objections, as the reader will at once perceive that the animal must repeatedly inspire and expire the same air, so that, strictly speaking, the experiment is performed under abnormal circumstances. The longer the animal is retained in the apparatus, the greater will be the amount of carbonic acid present in the confined atmosphere; and if the experiment be continued until the per-centage has much increased, disordered respiratory movements, suffocation, or even death, will result. Supposing even that such untoward results are prevented by increasing the proportion of air sufficiently to permit the animal to breathe without any apparent uneasiness, there still remains a not unimportant source of error. Vierordt has pointed out that the quantity of carbonic acid exhaled at each expiration gradually diminishes in proportion as the amount of that gas present in the respired air increases. Consequently, when the animal is first placed in the box, a much larger quantity of carbonic acid will be given off with each expiration than immediately before its removal from the apparatus. The amount of oxygen absorbed will also diminish as the surrounding atmosphere becomes impoverished of the gas. There remain still some subordinate obstacles to the attainment of exact results. For example, the movements of the animal, the emission of urine, from which a quantity of carbonic acid is exhaled, the expulsion of intestinal gases, &c.

These latter, however, are objections which equally accompany the employment of the complicated apparatus resorted to by Regnault and Reiset, and of the simple box used by Valentin. The former objections, on the other hand, are only applicable to the mode of experimenting adopted by our author. As, however, his research was not instituted with the object of determining the absolute, but only the relative amount of the gases interchanged, the securing of a constant supply of fresh air may appear a matter of minor importance, especially since care was taken that the animal should be removed from the apparatus before the per-centage of carbonic acid had been materially augmented. One source of error still remains, and one which we cannot refrain from noticing, as it might have been easily avoided. In a large, tightly-closed vessel like that employed by Valentin, the diffusion of the gases is extremely slow, and accordingly their relative proportion in a given volume varies at different heights. The consequence is, that an analysis of the gaseous mixture taken from the upper stratum yields very different results from those of a similar analysis from a lower stratum. Our author therefore, we fear, made a slight mistake in only analysing the upper stratum of air, or at least in not having employed some means of thoroughly mixing the gases before withdrawing a certain quantity for analysis. These remarks will scarcely appear to our readers hypercritical or unnecessary, when we tell them that Valentin found during his experiments that thermometers placed in the box at different degrees of elevation indicated various degrees of temperature, and that the application of warm or cold water to the exterior of the box was not followed by an equal increase or decrease of the temperature at the different heights. This is additional proof that the diffusion of the confined gases takes place very slowly. The thorough mixing of the air before a portion is removed for analysis, is therefore of the utmost importance.

We have seen a very simple contrivance for the attainment of this object in an apparatus recently constructed by Dr. Harley, for the purpose of carrying out researches on the respiration. The contrivance consists of a little wheel, something like a miniature windmill, moved by a handle placed on the outside of the box. Had a contrivance of this sort been used by Valentin, some of the discrepancies occurring in the course of his experiments might perhaps have been avoided.

We must now return to our sketch of our author's experiments. After the amount of air rendered effete by the healthy animal was ascertained, a wound in the neck was made and the nerves exposed, but not divided. On the following day, the animal was again placed in the box, and the effect of the wound ascertained. The results of one of the experiments, which may be regarded as an average example of the whole, are as follows:—

After a wound in the neck was made, the number of respirations in a given time increased about $\frac{1}{25}$. The relative quantity of oxygen absorbed slightly decreased, while the volume of the nitrogen exhaled was even more decreased. The absolute amount, however, of oxygen consumed, and of carbonic acid expelled, during one hour, increased by about $\frac{1}{35}$, and the amount of liquid lost by perspiration was nearly $3\frac{1}{2}$ times greater than in a state of health. The temperature of the animal's body likewise received a slight augmentation ($\frac{1}{100}$).

Having thus learned the effect produced on the interchange of the gases by a mere wound, our author was prepared to appreciate the results depending upon the section of the vagi. He began by first dividing one pneumogastric nerve, and the following change was found to take place: The number of respirations diminished by $\frac{1}{25}$; the amount of oxygen absorbed in a given time increased by about $\frac{1}{8}$, and the volume of carbonic acid exhaled by $\frac{1}{25}$. It was also observed that the quantity of nitrogen given off had augmented to about $\frac{3}{8}$, and the amount of perspiration was doubled.

The increase in the interchange of gases by the lungs, and of the transpiration, both by the pulmonary and cutaneous surfaces, became marked in a still greater degree after the division of both pneumogastric nerves. In one case, where an opening in the trachea of the rabbit had been previously made, the number of respirations was found to diminish to one-half. The absolute amount of carbonic acid exhaled by the lungs during the experiment decreased to about $\frac{1}{20}$; while, on the other hand, the quantity of oxygen absorbed rose to nearly $\frac{2}{5}$. The temperature of the animal during the same time fell $\frac{1}{100}$.

In another example, where both the vagi were divided and no opening in the trachea was made, the respirations decreased in number about $\frac{7}{10}$. The absolute quantity of oxygen also had rose $\frac{1}{4}$, and that of the carbonic acid given off fell to about $\frac{1}{16}$. The perspiration, on the other hand, was even more than doubled, while the temperature of the animal's body diminished from $\frac{1}{16}$ to $\frac{1}{17}$ of what it was in a state of health.

Section of the inferior laryngeal nerves was found to have a greater effect on the amount of gases interchanged by the lungs than division of one pneumogastric. In many respects the result of this operation corresponded very closely with that of division of both the vagi, there being, however, this difference, that while section of the pneumogastric nerves is rapidly followed by the death of the rabbit, the injury to the laryngeal nerves does not destroy the life of the animal until several days, or even weeks, have elapsed.

The concluding pages of Valentin's monograph treat of the force of the respirations, and are illustrated with well-executed diagrams.

REVIEW XII.

The History, Diagnosis, and Treatment of the Fevers of the United States. By ELISHA BARTLETT, M.D., late Professor of Materia Medica and Medical Jurisprudence in the College of Physicians and Surgeons of the University of the State of New York, &c., &c. Fourth Edition, by A. CLARK, M.D., &c.—*Philadelphia* and *London*, 1856. 8vo, pp. 610.

WE hail with pleasure this fourth edition of a work on which many years ago one of our predecessors* bestowed the attention demanded by the importance of the subject, and the skill and learning with which it was discussed. It is pleasing to us to learn that the public voice has confirmed the opinion we then formed of "Bartlett on Fever;" but the pleasure is not unmixed, for the gifted author is cold in the grave, to observe, think, and write no more for the benefit of mankind. But, as the Greek proverb says, "a tree never wholly perishes," and much of the worth, much of the utility of many men now living is probably due to the example and labours of Elisha Bartlett. A man's good deeds live after him, and it is good that it should be so, for thus is the world progressive.

Certain considerations induce us to go beyond the mere brief and perhaps laudatory comment which we might have bestowed on the fourth edition of a work we had caressed as a vigorous offspring, an *animosus infans*, when, some fourteen or fifteen years ago, it first saw the light. At this period there was much doubt in the minds of some, and it may be not less conviction, on grounds too slight, in the minds of others, regarding the classification and division of fevers, and no little controversy was waged in France, England, and the United States on the subject. It would be unduly bold in us to assert that all is now clear—that there is no discrepancy of opinion among medical observers and reasoners on points which were then the subjects of controversy. But it is unquestionably the fact that the time which has intervened has not been wasted, but that close observation and sound reasoning (the sole safe guides of medicine) have done much to illustrate what was obscure, and to give certainty to what was doubtful, regarding continued fever, its unity or diversity.

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* See British and Foreign Medical Review, vol. xvii. p. 375.

The question in dispute really was, whether our old and too familiar typhus, and a form of fever, certainly in its outward and visible signs very much resembling it, which having borne at first various designations, all physicians now agree to call typhoid fever, are but modifications of one disease; or whether they are, however similar, yet two distinct diseases; as, for instance, measles and scarlatina have long been acknowledged by the profession to be, a certain degree of outward likeness notwithstanding. The opinion expressed by Dr. Bartlett in his first edition was certainly in favour of the specific difference of the two diseases, but not unequivocally and positively so, for he says:

> "I have no wish to make out a case in this matter. I would avoid, scrupulously, anything like special pleading. The truth, as Louis's motto from Rousseau says, is in the things, in the facts and their relations, not in my mind, which attempts to judge and to interpret them. I am anxious only that this truth, be it what it may, should be ascertained. That this has been done absolutely and definitively I do not pretend. That typhoid and typhus fevers are clearly and unequivocally fundamentally distinct diseases may not have been positively demonstrated. I admit that the paper of M. Landouzy (relative to the epidemic in the prison at Rheims) throws some doubt upon the question; but, as has been remarked before, whether the two diseases be not specifically and nosologically unlike each other, it is equally important that the wide differences which confessedly do exist between them should be pointed out, and their real relations established." (p. 290.)

In our notice of the first edition we remarked, that

> "For the final adjustment of the question—that of the identity or diversity of typhus and typhoid fever—much will be justly expected from British writers; for we consider that a great deal of the confusion in which it is still involved has arisen from the vague, and, we would add, too declamatory character of some of the most popular British works on fever. The repair of the evil which we have done will be looked for at our hands."*

The expectation here alluded to certainly existed, and it is pleasing to us to add, has not been disappointed, for our excellent author, after stating that his further study and investigation of the subject had only served to remove from his mind the slight doubt or qualification with which his first judgment of the specific diversity of the two diseases was associated, leads us, by the terms in which he quotes the labours of our countryman, Dr. Jenner, to infer that the dispersion of the lingering doubt from his own mind was considerably due to the agency of the accomplished Englishman. He says:

> "I shall close this discussion with the words of an English physician, Dr. Jenner. This question has never been so carefully, laboriously, minutely, and philosophically investigated before, as it has been by Dr. Jenner. My opinion of the value of these investigations has already been sufficiently attested; I only wish to add, that apart from this value consisting in their results, and the new light they have shed upon an obscure and difficult subject, they constitute one of the finest examples in medical history of a sound and true philosophy, and show their author to be a worthy inheritor of the illustrious name he bears." (p. 297.)

In this country the question seems now practically settled. The difference of the cerebral condition in the two diseases; the sudden prostration and torpor of typhus, contrasting with the more gradual, but when formed, the more active and excited typhoid delirium; and the corresponding discrepancy in the expression of the countenance in the respective diseases, are the first grounds of distinction which strike the experienced observer. As the disease advances, the presence or otherwise of diarrhœa, of pain or uneasiness in the iliac region, or, it may be, of intestinal hæmorrhage, and the rose-coloured lenticular spots limited in the one case to the thorax and upper part of the abdomen, or the dark purple-coloured petechiæ diffused generally over the body and limbs, come to render certainty more certain, and the physician pronounces the name of the disease with as much confidence as he would declare one eruptive complaint to be small-pox and another measles. He does not reserve his diagnosis till diagnosis can no longer be useful—to the time, should it unfortunately arrive, when the anatomical lesions shall have placed the nature of the disease beyond all risk of controversy. The question whether affections differing so much in symptoms that the medical men can at once give to each its appropriate name—greatly diverse, indeed, in morbid lesions, and preserving in all localities these wide discrepancies—are but *casual* modifications of one and the same disease, seems to be regarded by the present practical-minded generation as no longer worth discussing. It seems to us doubtful, indeed, whether some of the resistance in the English mind to the adoption of the opinion of the specific difference between these diseases was not due to the importance attached by Dr. Bartlett himself, in his first edition, and other writers of eminence, to the history of the epidemic in the jail at Rheims by M. Landouzy, and this writer's opinion of its nature.

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* British and Foreign Medical Review, vol. xvii. p. 361,

On a subject, in our view, by no means unimportant, at least to British practitioners, relapsing fever, Dr. Clark, the editor of the work before us, says that, *if there be a distinct febrile affection to be called by this name*, he believes it has not been his fortune to see it. For our part, we certainly consider relapsing fever to bear a much closer relation to the bilious remittent fever—the product of malaria—with which our American brethren are abundantly well acquainted, than to the continued fevers, whether typhus or typhoid, of our own country. The marked periodicity of the relapses of this fever, "which come on like a fit of ague almost to an hour,"* and the enlargement of the spleen to a greater extent, according to Dr. Jenner, than in any other form of (continued?) fever, appear to us to point to a malarious origin. British practitioners have laboured very successfully, and all honour to them for it, at the investigation of the character, external and pathological, of this fever. Further illustration might probably, as it appears to us, be found by looking in another direction, at the general epidemic constitution, as Sydenham would call it, of the season in which this fever prevails. It is well known that from various parts of these islands where they were once familiar, agues and other forms of malarious disease have, as a general rule, disappeared. But it is likewise consonant with medical experience, that in unwonted seasons, it may be in those of which the heat is for a long time excessive, there is a reappearance of malarious disease in districts whence, to all outward and visible signs, it had long been banished. Might not some light be thrown on the etiology and true nosological position of this form of fever by observation directed towards the other forms of disease prevailing simultaneously with it, and likewise to the condition as to temperature, &c., of the season in which it exists? Even should there not be discoverable, to any great extent, the most familiar and generally admitted products of malaria, yet may we perhaps discover a case or two of indigenous intermittent in a district where such a disease has not for years been seen but as an exotic, or there may be discernible an unwonted prevalence of the lowest product of malaria — brow ague, or other forms of intermittent neuralgia. When it has been our lot to see relapsing fever, it has always been in unwonted seasons, and when there was something in the type of disease prevailing which led us to conclude that a malarious influence existed. We certainly consider the subject worthy of investigation in this direction, and we do not discern in the fact of Dr. Clark's want of acquaintance with relapsing fever, any argument against the view we are rather suggesting than asserting. The effects of malaria vary so much according to climate, that we should not expect to find them the same in the British Isles as even in the northern States of the Union.

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* Notes on the Epidemic Fever of 1847–8. By William Robertson, M.D., &c. Edinburgh Monthly Journal, p. 406. 1849.

The opinion we expressed of the great value of this book, in the notice of the first edition contained in one of our predecessors, remains unchanged. The ample information relative to those fevers, possessed in common by both countries, renders it valuable to British practitioners; but, widespread over the world as are the colonies and commerce of our Empire, the portion of the work regarding the more tropical forms of fever ought also to claim their special interest.

REVIEW XIII.

Hints on the Pathology, Diagnosis, Prevention, and Treatment of Thoracic Consumption. By J. C. HALL, M.D., Fellow of the Royal College of Physicians, Edinburgh; Physician to the Sheffield Public Dispensary; late Lecturer on the Practice of Medicine at the Sheffield Medical Institution. Third Edition, enlarged. With Microscopic Illustrations.—*London*, 1856. pp. 188.

THIS little volume is the least pretentious, though not the least useful, of the many works on consumption which have been recently published. Its substance appeared originally, under the title of 'Bed-side Sketches,' in the pages of a weekly contemporary. Successive reprints of these sketches, with additions to each, have brought the volume into its present form, still sketchy, it is true, and somewhat irregular in its arrangement, but, nevertheless, admitting of easy access to a number of points of greater or less interest.

Dr. Hall commences by discussing the nature of tuberculous disease of the lungs, and, with all who know anything of the pathology of phthisis, he repudiates the idea of its being a local affection.

The second chapter treats of tubercle, its varieties in the lungs, and the metamorphosis which the deposit undergoes—viz., cretification and softening. In the one case, the tuberculous matter loses its watery and organic elements; the earthy salts remain, constituting the calcareous masses, of greater or less size, which are sometimes expectorated, but more often found in the lungs at post-mortem examinations. In the other case, the deposit undergoes a change analogous to, and in some degree identical with, fatty degeneration. The tissues involved in the deposit participate in this process. Both alike soften and break up, vomicæ are formed, the contents of which find their way into the bronchi, and are expectorated.

We have no satisfactory information as to the circumstances which tend to produce results apparently so different from each other. It is probable that they depend on differences in the primary composition of the deposit. It is not difficult to conceive that hard grey tubercle may tend to become harder, and dries; and that the softer yellow tubercle may possess an inherent tendency in the opposite direction. For closely as the different varieties of tubercle resemble each other in microscopic and other characters, there is no doubt that they differ essentially both in their vital properties and physical constitution. These are differences which we do not fully comprehend. They are inviting objects for further research. A better acquaintance with these properties will give us information of which we stand much in need, as to the progress and result of tubercular depositions in the lungs.

Great apparently as the difference whether tubercle cretifies or softens, the object aimed at is the same. Nature seeks to protect the lungs, in the one instance from the influx of a new and foreign body, in the other to eliminate that body altogether. Nature is often successful in these operations. Still, more often no such attempt is made, deposition and destruction go on simultaneously, till the lungs, more or less completely occupied by solid masses or destroyed by cavities, are no longer capable of supporting life. In other cases these processes go on likewise, but not simultaneously. Tubercles are deposited under the influence of certain agencies to which the individual is subjected. The operation of these influences having ceased, no further deposition takes place, the tubercles become cretified, or, softening, are eliminated. The disease is arrested, so to speak, and the patient does well. He may cease to be liable to further deposit. Still, more probably he is again subjected to injurious influence; he is already predisposed to disease, and fresh deposits take place. These depositions may be again arrested, only to occur subsequently under like circumstances. Such is the progress of the vast majority of phthisical cases met with in practice. Their course is instructive, as showing how frequently phthisis may be arrested by nature or art, and suggestive to those who have to treat the disease, of the importance to sufferers from the disease, of the necessity of avoiding any influence which could rekindle the flame which has been extinguished. Over and over again have we seen the progress of disease in its early stages checked, and the patient restored to almost perfect health. Danger is then forgotten, precautions are thrown aside, old habits are renewed, and with them returns disease, disease less likely to yield to treatment than that which had previously been arrested. It comes, then, to be of almost as great importance to study the means of preventing the recurrence of tuberculous deposit, as of arresting its course in the first instance. On the extent to which the health can be restored in these cases of arrested disease, Dr. Hall makes the following remarks:

> "From what I have seen of cases where an attack of tubercle has ended in excavation, I venture confidently to assert that although under treatment very great improvement does take place, there is, unquestionably, a limit beyond which, so far as my experience enables me to judge, recovery does not extend. By this I mean, that a person who has once weighed, as in one of the cases just narrated, twelve stone, never does so again: he never gets back the flesh which he has lost. It is true that he may follow his usual calling, but to his convalescence there will be from time to time certain hindrances, and he never becomes again—at least, I have never yet seen an instance—either in muscle or in vital energy, quite equal to that standard of health which he had once attained." (pp. 48, 49.)

The vast majority of cases correspond with the author's experience. It is, however, satisfactory to know that instances do sometimes present themselves in which even excavations having formed, the individuals regain all the flesh and strength they had lost. In such cases the loss of lung-substance is limited. The digestive functions are well performed, the circulation is quiet, and the patients are placed in circumstances favourable to health. It is otherwise in cases where much lung-substance has been lost, simply because as these organs contribute largely to blood formation, the nutrition must suffer if the blood constituents fail in either quantity or quality. The explanation adopted by the author, that an excess of carbon remaining in the blood acts as a poison on the system, is somewhat inconsistent with the successful use of cod-liver oil in these very cases.

The physical signs of consumption are given, in the chapter appropriated to their description, with care and much completeness. The same cannot be said of the practical application of these signs as illustrated in the histories of the cases reported throughout Dr. Hall's pages. Nothing can be better than the chapter on "The Physical Examination of the Chest." Occasional reference is made in different parts of the volume to the presence of wavy inspiration. We mention it in order that we may offer a word of caution against placing much value on its presence. The sound depends, in nine cases out of ten, on the mode in which the patient breathes. In other cases it occurs in connexion with the action of the heart, and its impulse extending to the great vessels, and through them to the air in the bronchi at the root of the lung. In a few it may result from limited pleuritic friction, and in still fewer from tubercles or other deposits in the lungs.

It may be regarded, with the red line on the gums, as amongst the most questionable signs of the presence of phthisis.

Passing from this class of phenomena, the author discusses the evidence to be derived from the microscopic examination of the sputum; on its value he lays considerable stress, and he gives some microscopic illustrations by Mr. Tuffen West of the appearances which it presents. We should be disposed to agree with Dr. Hall and those who have preceded him in describing the appearances of the expectoration characteristic of the early stages of phthisis, if it were possible to fulfil some of the following conditions. In the first place, we must have the means of recognising tubercle as something *sui generis*, which is unlike and cannot be mistaken for anything else.

Now, there are not half a dozen observers who agree as to what the composition of tubercle really is. The corpuscles which by some are believed to be characteristic of the deposit, are believed by others to be mere accidental elements derived from the epithelium or other texture of the organ occupied by morbid material.

Again, we must suppose it possible to obtain the tuberculous matter in the expectoration unmixed with other elements likely to obscure or render its recognition difficult, if not impossible. Those only who have examined the expectoration in the early stages of phthisis, with a view of obtaining aid to diagnosis, can tell how valueless and vain the researches of inquirers have hitherto been. It is different in the more advanced form of disease—the deposit softens, the lung-texture participates in the change, and we find in the expectoration something definite. This is not tubercle—it is the elastic tissue which enters largely into the structure of the air cells: when the peculiar appearance of this texture is recognised in the sputum, there can exist no doubt that the lung-tissue has given way. It may, however, be stated, too, that this tissue, which has been said to be peculiar to the lung-structure, may be found in other parts of the body, as in the mammary gland; something very like it may be found in the cheesy particles taken from the tonsils. There is little probability of the elastic tissue from the mammary gland, even in cases of abscess of that organ, finding its way under the microscope as expectoration; still, as the elastic tissue exists there, and as, within our knowledge, the mistake has once been made by an experienced observer, it may be made again, and should be thought of.

The presence of lung-tissue is a fact *per se*, and may confirm the knowledge obtained by auscultation and percussion. We have never seen a case in which it could do more. In obscure or doubtful cases we must obtain information from every source: of this Dr. Hall is not unmindful, and he discusses with care the symptoms, as well as the physical signs, which characterize tuberculous disease of the lungs. A chapter follows on the means of preventing these diseases, and another on their treatment. These chapters contain many judicious observations, but nothing so new as to call for special observation.

PART SECOND.

Bibliographical Record.

ART. I.—*A System of Practical Surgery.* By WILLIAM FERGUSSON, F.R.S., Professor of Surgery in King's College, London; Surgeon to King's College Hospital; Surgeon Extraordinary to Her Majesty, and Surgeon to H. R. H. the Prince Consort. Fourth Edition.—*London*, 1857. pp. 833.

IN the work before us we are informed that the prevailing custom of interspersing surgical works with physiology has been dispensed with, and that the sciences of chemistry, pharmacy, and materia medica have scarcely been referred to. This will account for what must appear to many the peculiar character of Mr. Fergusson's work. It deals with that which may be seen and done. But it refers in a very slight degree to those more subtle processes of nature by which diseased as well as healthy actions are carried on, and by which parts injured or diseased are restored to their natural condition. These subjects, we are told, belong alike to the physician and the surgeon, but it certainly would be desirable if those points which are not usually fully described by medical authors should be more than cursorily alluded to in surgical works.

There are many subjects—such, for instance, as the results of the deposit of strumous matter in the articular extremities of bone, or the occurrence of secondary inflammation after amputation, of which medical authors have not usually undertaken to speak, but concerning which the student may reasonably expect to be informed in the class-books placed in his hands. There is, however, little cause for complaint in this respect while other manuals, rich in scientific illustration, valuable alike to the physician and surgeon, such as 'Druitt's Vade Mecum,' are within the reach of all.

As a work on operative surgery, Mr. Fergusson's holds deservedly a very prominent position. There are many points in it which he has made peculiarly his own. Thus, since the publication of Mr. Fergusson's work, a very decided improvement has been made in the mode of removing tumours from the upper jaw. Mr. Fergusson makes an incision in the centre of the upper lip. This "permits advantage being taken of the natural opening of the nostril, and so permits a large opening in the face, through which almost any ordinary-sized tumour may be extracted." (p. 680.) Since the last edition of this work was published, Mr. Fergusson observes that he has never performed any other operation on the upper jaw.

Again, in regard to the operations on the lower jaw, Mr. Fergusson remarks:

> "Within these few years I have modified the operations in regard to carrying the incision through the lip. I doubt if this is ever required, and I am of opinion that any portion of the lower jaw, or even the whole bone, may be taken away without cutting the margin of the lip at all." (p. 665.)

The last two editions of Mr. Fergusson's work have contained some valuable observations on the development, or rather arrest of development, in malformations of the upper jaw.

> "In single fissure, and especially in double, the middle portion is often seemingly longer in proportion than the rest of the alveolar ridge, and sometimes it projects so conspicuously as to add greatly to the unseemly condition of the part." (p. 564.)

This projection may be confined to one side, or it may consist of two portions, one on either side of the median line.

> "This central portion is composed of two intermaxillary bones, resembling in some respects the condition of the upper part of the mouth in many of the inferior animals." (p. 566.)

These bones, arising from separate points of ossification, may one or both be removed with the scalpel, together with the deciduous teeth which they contain.

Mr. Fergusson's operation of staphyloraphy we regard as one of the greatest improvements of modern surgery, and we notice it here because other operations of the same kind have recently been advocated. Mr. Fergusson divides the muscles which give an arched form to the palate with a knife bent at right angles. This particular form of knife enables him to divide the muscles without injuring the soft palate itself. Mr. Pollock, of St. George's Hospital, has preferred the plan of cutting through the soft palate, and so dividing at the same time the levator palati on each side. Now, without doubting Mr. Pollock's success in performing his own operation, we are bound to say, from the results which we have witnessed in other hands, that we would recommend Mr. Fergusson's original way of doing the operation to those who have not had experience on the subject. There are many other original points of excellence in this work which we might notice, did our space permit. As a work on operative surgery, as we have said, we regard it as in the very first rank, and we trust that at some future time we may see its usefulness still further enhanced, by observing those scientific parts of surgery which do not involve mechanical operations as fully described as those that do.

Art. II.—*Experiences of a Civilian in Eastern Military Hospitals, with Observations on the English, French, and other Medical Departments, and the Organization of Military Medical Schools and Hospitals.* By Peter Pincoffs, M.D. Lugd.—*London*, 1857. 8vo, pp. 202.

We regret that we have been unable to notice this work sooner, because the interest attaching to our part of it is dying away. The public and the profession are weary of the general tale of Crimean shortcomings, and although we hope some day to see a scientific work on the diseases of the troops during the disastrous winter of 1854–5, it must be a work of a different kind from that now before us, to excite the attention of the profession.

Dr. Pincoffs does not, indeed, profess to do more than give a mere sketch of the hospital arrangements of the different nations at Scutari, and has done so in a light, readable style. He did not arrive there till April, 1855, by which time the lamentable defects of our general hospitals had been to a great extent remedied, and the sick were receiving careful nursing and all necessary "comforts," under the able, unremitting, and self-denying superintendence of Miss Nightingale. He makes a comparison between the English and French hospitals by no means flattering to the latter, and draws an unfavourable picture of the effects of making the medical officer subordinate in everything connected with the hospital supplies and arrangements to the *Intendance.*

Our author's history of the introduction of the "civil element" into the army hospitals, and of the mode in which it worked, is so evidently written with a strong feeling of personal disappointment and of dislike to the "demigod at Whitehall and his high priests in the Crimea and at Scutari," that we forbear to enter upon its discussion. The want of patients, which is one ground of complaint, arose manifestly from the operation of a correct principle in military arrangements—that of keeping all the men likely to become soon efficient as near the front as was compatible with the demands upon the services of medical officers, and of sending to England without unnecessary delay those who were likely to be a burthen upon an army in the field. The civil hospitals would have been invaluable had the events of the winter of 1855–6 resembled those of the preceding year. As it was, they were a measure of precaution adopted after the emergency was over, and in anticipation of the continuance of an exceptional state of the army, which happily ceased to exist.

But there is another portion of the work before us which possesses great interest at the present moment, when the reorganization of the medical department of the army is known to be under the consideration of her Majesty's Government. Dr. Pincoffs gives a short account of the British, French, Austrian, Prussian, and Dutch Army Medical Departments, the mode in which they are recruited and governed, their systems of promotion, rates of pay, and means of exciting emulation. He appears to prefer the French system, if it could only be relieved from the incubus of the *Intendance.*

> "The fact of the medical officers being dependent on a non-professional Intendant for everything which concerns the external and internal management of the hospitals, and also for the advancement of their personal interests, is productive of evil consequences to the patient, and gives rise to serious discontent among the medical staff."

Our author states fairly enough the chief drawbacks under which the British medical department labours. Among these may be noticed, the want of a school of military medical instruction, as the young officer is often obliged, in consequence, to acquire his knowledge of the specialties of the service at the expense of the soldier, and with serious discomfort to himself. The difficulty, or almost impossibility, of the medical officers procuring leave of absence to enable them to attend lectures in any of the medical schools, is a barrier to their keeping pace with their brethren in civil life in the acquirement of professional knowledge, and especially in those more recent branches of science which are being daily more fully developed. The system of promotion, which is almost exclusively by seniority, holds out no inducement to exertion on the part of talented officers; while the limited share of honours conferred (and even that until lately was denied them) tends to produce a feeling of inferiority and depression which cannot fail to extinguish zeal. Another serious evil is the amount of administrative labour thrown upon the medical officer, which necessarily interferes with his professional work; indeed, the duty of the higher ranks is so purely administrative, that they never have the charge of sick, but merely superintend those who have. This superintendence, however, is a source of much annoyance and ill feeling in the department.

The chief remedies for existing evils in the department which our author proposes, are the establishment of a military medical school for the education of young men for the department; an examination before promotion; staff appointments to be conferred by *concours*, the grades above staff-surgeon to be conferred by seniority and selection; the establishment of travelling fellowships as a stimulus to emulation; and a more liberal distribution of honours.

> "If non-combatants are not entitled to any honours now usually bestowed in the army, an order might be created for the department, in imitation of the Bavarian *Militär-Sanitäts-Dienst-Zeichen*, which is bestowed for services performed in times of war only, and to which a small pension is attached, as is the case with the Legion of Honour. Such decorations are within the grasp, not only of the favoured few who have the rare opportunity of doing some dashing action in the field, when no Englishman is ever found wanting, but also of the many laborious deserving men who perseveringly combat with no other than their own peculiar foes—disease and death."

We do not agree with Dr. Pincoffs' scheme for a military medical school, because we prefer that the education of the medical officer should be left to the existing schools. We have such confidence in the principles of free trade, as to entertain no doubt that, if the requirements are made known, the supply of well-educated medical men will soon be found equal to the demand. All that should be required of Government is to establish at their principal military hospital a course of instruction in military hygiène and the special duties of the army surgeon, which every young officer should be required to attend, after having gained his commission by a competitive examination, and before he is appointed to do any duty.

Nor do we agree with our author in thinking that his scheme would be more economical. The number of medical officers could not be well reduced, for it is no economy to bring a department down to the lowest point compatible with working; and if it produced, as he thinks it would, more rapid promotion, a necessary consequence would be an increased non-effective list—an expense always grumbled at in this country.

Our author has contrived to throw a good deal of light reading into his book, and thus to make it more amusing than works on such subjects usually are. We are almost tempted to reproduce his sketch of, and panegyric upon, Florence Nightingale, "the Providence of the barrack-hospital." We must, however, for this, as well as for other topics upon which we should be glad to dwell, refer the reader to the book itself.

ART. III.—*Lectures on the Principles and Practice of Physic.* Delivered at King's College, London. By THOMAS WATSON, M.D., Fellow of the Royal College of Physicians, late Physician to the Middlesex Hospital, and formerly Fellow of St. John's College, Cambridge.—*London*, 1857. 8vo. Vol. I., pp. 871. Vol. II., pp. 984.

LECTURERS, practitioners, and students of medicine will equally hail the reappearance of the work of Dr. Watson in the form of a new—a fourth—edition. We merely do justice to our own feelings, and, we are sure, of the whole profession, if we thank him for having, in the trouble and turmoil of a large practice, made leisure to supply the hiatus caused by the exhaustion of the publisher's stock of the third edition, which has been severely felt for the last three years. For Dr. Watson has not merely caused the lectures to be reprinted, but scattered through the whole work we find additions or alterations which prove that the author has in every way sought to bring up his teaching to the level of the most recent acquisitions in science.

In the first volume the changes are less numerous than in the second, in which above a hundred pages of new matter are to be found. In the former, Dr. Watson's observations on anæsthetics, and his remarks on their early employment in the twelfth century by Hugo da Lucca, cannot fail to attract attention; while his remarks on the types of disease, *àpropos* of Dr. Bennett's views, must equally obtain a more extended perusal now than they would otherwise have enjoyed.

In the second volume, there are numerous and important additions in the chapters treating of mercurial poisoning, on cardiac and aortic disease, and on abdominal diseases. But the great fact connected with this edition is the frank adoption by the distinguished author of the views advocated with so much perspicuity and zeal, on the subject of typhus, typhoid and relapsing fevers, by "the Dr. Jenner of our time." This change in his views had of course necessitated the rewriting of the 73rd and 74th Lectures on Fever.

We doubt not that we shall often recur to Dr. Watson's admirable volumes with pleasure and advantage. He is now to us, and to the bulk of the profession in England, an old familiar friend—one to whom we each desire to offer our individual homage and respect, while we feel a pride in pointing to him, the gentleman and the physician, as a representative of the best and most high-minded in the profession of Great Britain.

ART. IV.—*The Anatomist's Vade Mecum: a System of Human Anatomy.* By ERASMUS WILSON, F.R.S. Seventh Edition.—*London,* 1857. pp. 725.

THE present edition of this work consists of eleven chapters, illustrated by two hundred and sixty-nine figures, many of them, as we noticed in a former review, drawn from the microscope by the author himself, with the aid of the camera lucida.

Of the excellences of this work we have on former occasions fully spoken, and have now only to add, that the author in the present edition acknowledges the assistance he has received from Professor Retzius, of Stockholm, who says that he uses the 'Anatomist's Vade Mecum' for students in the dissecting-room. "It has become my favourite Manual for young students, for I find that by it they get a clearer and quicker insight into the study of anatomy than by any other book."

ART. V.—*A Manual of the Practice of Medicine.* By T. H. TANNER, M.D., F.L.S., Licentiate of the Royal College of Physicians, late Physician to the Hospital for Women, &c., &c. Third Edition, revised and enlarged.—*London,* 1857. pp. 451.

AMONG the many manuals of the present day we should have a difficulty in singling out one which more completely answers its purpose than the 'Manual of the Practice of Medicine,' by Dr. Tanner. Its descriptions of disease are clear and concise; the most recent acquirements of science are introduced; and while we find the author yielding to his cotemporaries the praise fairly due for original investigations, his pages carry the conviction that he is himself an observer and practically conversant with the subjects he treats of.

A copious formulary of medicines is added in the form of an appendix, and will doubtless contribute to render the whole a favourite with practitioners and students, as a reminder or as a book of reference. To both we cordially recommend it.

ART. VI.—*Diseases of the Stomach and Duodenum.* By CHARLES EVANS REEVES, B.A., M.D., Subgraduate in Medicine of the University of London, and Member of the Faculty of Physicians and Surgeons of Glasgow.—*London,* 1856. pp. 354.

IT is by no means easy to give a fair and true account of this work. Considerable labour has evidently been bestowed upon it, as the numerous citations testify. The author seems also to have observed for himself, and to have had practical acquaintance with the diseases of which he treats. Still, we must say the impression left on our mind after perusing it is not satisfactory. The general descriptions are rather vague and diffuse, and (perhaps from our own obtuseness) appear wanting in force and clearness. The cases are often much less accurately recorded than could be wished, and the instruction to be derived from them not always very apparent. The pathology and morbid anatomy is behind the mark of the present day. Still it would be very unjust to deny that the work contains a great deal of information, and may no doubt be referred to with advantage. To some statements we must take decided objection, as, for instance, when bleeding and mercury are enumerated among the measures from which the best results may be expected in the treatment of perforation; or cancer-cells are put down as constant in the matters evacuated in pyloric cancer. The best part of the work, we think, is that which describes the diseases of the duodenum. Even in this, however, we must note that there are many cases brought together which appear very pointless and unsatisfactory, and which would better have been omitted. Such as, for instance, No. 16, which is given as one of chronic duodenitis, although there existed also encephaloid disease of the liver, jaundice, and chronic gastritis, and death occurred with pleuro-pneumonia. So also we object to No. 8, recorded as a case of chronic duodenitis, although at the post-mortem "the liver was very large, in some places harder than natural, but in others as soft as brain," while "the state of the duodenum is not noticed!" Three cases are given, which seem to have been under the care of the author himself, of fatty discharges from the bowels; these are well observed and narrated, and constitute a valuable contribution to the future history of this obscure affection. In the two first the symptoms were those of chronic duodenitis, in the third there were morbid changes found at the autopsy in the liver, pancreas, and duodenum.

Art. VII.—*Medical Anatomy.* By Francis Sibson, M.D., F.R.S., Physician to St. Mary's Hospital.—*London.* Fasciculus V.

The present fasciculus of Dr. Sibson's valuable work contains three views of the thoracic and abdominal cavities taken from behind, which cannot fail to be of great use to the student and practitioner. In the first plate the surfaces of the lungs, the kidneys, the great vessels, and the adjoining organs, are exposed by the removal of the bones and soft tissues; in the letterpress accompanying this plate the author supplies us with an elaborate table indicating the relation in thirteen different subjects of the main organs or chief parts of organs to the vertebræ. The second plate exhibits a deeper layer of the same aspect; the posterior portions of the lungs are removed, so as to expose the chief divisions of the trachea and large bronchi; the arch of the aorta, the right auricle, with the pulmonary arteries and vena cava ascendus are bared; the spleen, the thoracic duct, the posterior part of the liver, the pancreas, with numerous coils of intestines, are fully displayed, while a portion of the large curvature of the stomach peeps out between the spleen and the aorta. In the third plate, (the fifteenth of the whole series) the dissection is carried still further, and the parts brought to view are the epiglottis and anterior surface of the larynx, the heart, the anterior portion of the liver, and the gall-bladder, the urinary bladder with its ureters, the prostate and bulb of the urethra.

In the commentary accompanying the plates, Dr. Sibson presents the reader with a very elaborate analysis of a large collection of observations of aortic aneurism, which however is in itself so much condensed as to render it impossible for us to transfer any part of it to our pages without damaging the context. No one can henceforth study the subject of aneurism without having recourse to Dr. Sibson's memoir. In the first work of importance published since this fasciculus, the fourth edition of Dr. Watson's Lectures, his results are already alluded to. However, while we recommend the fifth fasciculus more particularly on account of the valuable information it presents us with on aortic aneurism, we would wish to impress our readers with the high sense we entertain of it as a work of art and of great scientific merit generally.

We do not fear to be stigmatized as false prophets, if we promise Dr. Sibson's work, if carried out in the same spirit which is evinced in the first five numbers, the range of most private medical libraries, to say nothing of medical schools, and reading societies.

ART. VIII.—*Report of the Surgical Staff of the Middlesex Hospital to the Weekly Board and Governors, upon the treatment of Cancerous Diseases in the Hospital on the plan introduced by Dr. Fell.* Printed by order of the Quarterly Court.—*London*, 1857. pp. 114.

WE adverted to the treatment of cancer employed by Dr. Fell in the October number of this Review, and urged that the *sanguinaria canadensis*, concerning which so much has been said as the new ingredient in the applications referred to, was of little use in promoting the enucleation of the tumour. This view is confirmed by the Report of the Surgeons of the Middlesex Hospital now before us, in which we receive a succinct and satisfactory history of all the proceedings which have taken place at that Institution in connexion with Dr. Fell.

Our readers may be reminded that a special endowment exists at the Middlesex Hospital for the permanent maintenance of patients affected with cancer, which was established in 1791 by Mr. Samuel Whitbread; one of the terms of the gift being that "when in the judgment of the medical gentlemen of the hospital any extraordinary circumstance may occur, or any remedy be discovered, a record shall be made and kept of the same for the inspection of the public." The authors of the Report go on to state that—

"During the sixty-six years which have elapsed since its foundation, the Governors of the Hospital have been desirous to diffuse the benefits of the cancer establishment over as wide a circle as possible, by rendering it available for the trial of every new method of treatment which could with safety and propriety be adopted, the sole condition upon which such experiments have been allowed to be conducted being, that those who proposed them should previously satisfy the medical staff of their safety, and within a reasonable period consent to make the treatment public."

Upon these principles the surgeons of the Middlesex have acted in their compact with Dr. Fell, and we are of opinion that in doing as they have done they have performed a duty to science and humanity, while they have wisely conformed to the laws of the hospital to which they are attached. In the short statement signed by the same gentlemen who take the responsibility of the present Report, which was published in the preface to Dr. Fell's book, they declined expressing an opinion upon the average duration of his treatment, or upon the question whether, "in the event of a return of the disease, there might be any difference observable from what is known to take place after excision." At the time of that statement, the period of trial of the new method did not extend to more than nine weeks. The present Report is dated five months later, and though this interval could not suffice to determine absolutely the important questions bearing on the return of the disease, it enables the surgeons of the Middlesex to speak with greater confidence upon many of the points at issue in the battle between caustic and cutting.

It is clear, then, that the *sanguinaria canadensis* exercises no anti-carcinomatous influence, whether taken internally or externally; the pills containing the bloodroot "were not employed by Dr. Fell without being accompanied by local treatment, nor was their use continued after the removal of the external tumour and the cicatrization of the wound"—a fact that we should not have assumed had we been guided only by the urgent manner in which Dr. Fell speaks of "the vegetable portion" of his remedies in his own book.

The main feature of his proceeding consists in the successive and gradual division of the parts destroyed by the caustic, by which means it is allowed to percolate to the innermost layers of the disease. Its application would vary according to the condition of the surface; when the cancer was ulcerated, the paste* was applied directly to the surface in the first instance; when the skin was unbroken, its vitality was first destroyed by washing it over with strong nitric acid. The paste alone would suffice to destroy the skin, but its action in that case is much slower and more painful. After the formation of the first eschar commenced the characteristic process in the treatment of Dr. Fell:

> "Parallel scratches or shallow incisions were made along the charred skin, for the purpose of inserting into them strips of calico smeared with the paste. These incisions varied in number, being usually made about half an inch apart, but sometimes there were not more than four in a breadth of five or six inches. They were carried along the whole length of the eschar, and to a depth somewhat short of the living tissues beneath. For the first two or three days they were seldom deep enough to lodge the strips of calico: still even the scratches

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* ℞ Decocti sanguinariæ, ℥ij; zinci chloridi, ʒij; farinæ tritici, q. s. Ut fiat massa consistentiæ idoneæ.

sufficed for the percolation of the remedy into the subjacent living parts. Each day the incisions were a little deepened, and fresh strips of anointed calico, or rolls of cotton-wool covered with the paste, were inserted into them, until in the course of from two to seven weeks (the average time being about three weeks), the whole depth of the tumour was penetrated; and then the use of the paste was discontinued, and the eschar left to separate."

We refer our readers for the very lucid and practical description of the action of the caustic paste, of which it is almost superfluous to repeat that chloride of zinc forms the active ingredient, and of the systematic manner in which it is applied, to the Report itself. It forms an era in the history of the surgical treatment of cancer, and ought, therefore, to be in the hands of every one whose studies or occupation force him to reflect on this important subject. The cases, which are given in sufficient detail, fully bear out the general conclusions at which the authors of the Report have arrived, while they enable the reader to follow every link in the arguments which they employ. These are given under four heads:

"1. The constitutional effects of the treatment.

"2. The local effects of the treatment.

"3. A comparison of this treatment with that by means of the knife.

"4. A comparison of this mode of inserting caustics by incision with other modes of applying caustics."

The main point in the disquisition is the opinion expressed by the surgeons of Middlesex Hospital upon the feature which may be regarded as the characteristic novelty of Dr. Fell's method. We use the term advisedly, for though here and there a surgeon may have scored over, as it were by chance, a cancerous tumour, to which caustic had been applied, no one has until now adopted the system of making regular incisions with the professed object of allowing the caustic to enter more completely into the morbid growth. The pith of the whole Report is the opinion expressed by Messrs. Shaw, De Morgan, Moore, and Mitchell Henry upon these incisions. We cannot do better than conclude this brief notice with their concluding paragraph:

"*Incisions.*—The last peculiarity of this treatment is the practice of incisions; and we are of opinion that this is its only, but its very great merit. The sanguinaria is inert; the chloride of zinc paste was known before; but the incisions constitute a new feature in the treatment of cancerous tumours for which we find no parallel in the writings of the past or in the practice of present surgeons. Cancer, in its constitutional nature, remains as ruthless and as unassailable as ever. Chloride of zinc may or may not continue to be used for the destruction of the local disease; but the advantage placed in the hands of surgeons by the insertion of gradual incisions, claims henceforth their very frequent adoption in the treatment of cancerous tumours, as well as a grateful acknowledgment of the ingenuity of their inventor."

The names of the authors of the report are sufficient guarantees for the truthfulness of all the statements contained in it; but we may add that they use all due caution in the manner in which they approach the subject, while the details of the fifty-two cases which are appended fully bear out all the conclusions given in the body of the Report. If, then, Dr. Fell, as these gentlemen tell us, deserves our thanks for the ingenuity of his suggestions, they themselves merit our gratitude for the manner in which they have undertaken and carried out a task, which can scarcely have been one of unalloyed pleasure.

Art. IX.—*Archives of Medicine: a Record of Practical Observations and Anatomical and Chemical Researches connected with the Investigation and Treatment of Disease.* Edited by Lionel S. Beale, M.B., F.R.S.; Physician to King's College Hospital, and Professor of Physiology and General and Morbid Anatomy in King's College, London; Honorary Fellow of King's College. Illustrated with Woodcuts and Lithographs carefully copied from Nature.—*London*, 1857. No. I.

The contents of this first number of a new medical periodical, the object and purpose of which are sufficiently indicated by the title, are mainly contributed by the editor. In drawing so largely upon his own resources, his intention is to enable those whose support is desired, to form "some idea of the general nature of the periodical."

The 'Archives' open with a portion of a clinical lecture recently delivered by Dr. Todd upon the treatment of acute internal inflammations, upon which we refrain from making any remarks, because, though we might have no objection to adopting Dr. Todd's creed so far as it is here given, we might inadvertently pledge ourselves to conclusions which are not in consonance with our views and our experience. Dr. Beale follows with a very practical paper, and one that will be acceptable to all micrologists, 'On the Manner in which the Drawings Illustrating the Papers have been made, and of Obtaining Lithographs from Microscopical Drawings.' In the paper, Dr. Beale dwells forcibly on the importance of every microscopist ascertaining the magnifying power of his object-glasses, and supplies us with directions for preparing "a scale of measurement by which the dimensions of every object can be at once ascertained.' The next paper describes the method by which the editor separates the cholesterine which he has detected in the epithelial scales found in the urine of patients labouring under fatty degeneration of the kidneys. The reason why so few observers have found cholesterine in these cases is that "it is always dissolved in other fatty matters, so that its presence cannot be detected except by extraction with alcohol and subsequent crystallization." To the weight of the cholesterine the author attributes the subsidence of epithelium charged with oil molecules.

> "That the cell-walls and casts are not the sole cause of this subsidence is proved by the fact that individual oil-globules, quite free from these structures, are frequently found at the bottom of the vessel with the deposit. . . . . Crystals of cholesterine sink in fluids of a specific gravity even some degrees above 1000."

A report upon some examinations of chylous urine follows, which in the cases observed by the author was mainly due to the presence of fat in a granular condition; the urine commonly contained albumen at the same time. Astringents, and especially gallic acid, were the most successful remedies in the cases referred to.

The two ensuing papers, "On the Best Methods of Injecting Healthy and Morbid Structures," will doubtless command the attention of all practical physiologists and pathologists; the large experience of Dr. Beale entitles his remarks on such matters to particular respect. The next two brief papers are mainly descriptions of the illustrations, representing injected and other preparations of the liver. Two of these were taken from livers containing cysts—a morbid condition which is but rarely met with. Dr. Beale concludes that these hepatic cysts may be formed in at least three ways,—

> "1. By the obstruction of a branch of a duct, and by accumulation of secretion behind the obstructed part.
>
> "2. By the gradual dilatations, caused by the obstruction of a large duct extending backwards to the smallest ducts—even to the point where they become continuous with the cell-containing network of the lobule. The thin walls at length giving way, extravasation would take place amongst the vascular and cell-containing networks; under these circumstances the duct would gradually become obliterated, while these little cavities might remain in the form of closed cysts.
>
> "3. By a gradual alteration occurring in a portion of the secreting structure within the lobule, leading to the deterioration of some of the meshes of the vascular and cell-containing networks, and the gradual pouring out of a serous fluid to occupy the place of the wasted structures."

Dr. Beale's assistant, Dr. Moritz von Bose, is the author of the next paper, which contains the clearest account of the volumetric method employed for the determination of the chief constituents of the urine, that we have met with. The practical utility of this method will doubtless secure its general adoption as soon as it is better known; it is simple, requires but a small expenditure of time, and with ordinary precautions yields results that are reliable and satisfactory. Those anxious to carry it out cannot obtain the necessary information more easily than by referring to Dr. Bose's account.

The remaining papers are entitled "Chemical and Microscopical Examinations of Morbid Specimens," "Analysis of Softened Cerebral Matter surrounding an Apoplectic Clot in the Left Hemisphere of a Woman, of the Clot itself, and Healthy Portion of the Brain," "Case of Rape in which Spermatozoa were Detected in the Mucus removed from the Vagina," "Examination of Ragged, Fibrin-like Masses found in the Sputum of an Obscure Case of Solidification of the Right Lung," "Examination of a Large Tumour connected with the Thyroid of a Woman aged Fifty-one," and "Tumour connected with the Left Corpus Striatum in a Man aged Twenty."

Explanations of the ten plates, which are lithographed from preparations made by the author, and which illustrate the papers, conclude the letter-press.

Of the whole, we would say that a large amount of valuable and available information is compressed into a small space; and while we anticipate that the 'Archives of Medicine' will take a high rank among the scientific medical periodicals of Europe, we found that hope more particularly upon the personal zeal and the distinguished abilities which have already secured for Dr. Beale a large and lasting reputation.

Art. X.—*The Successful Treatment of Scarlet Fever: also, Observations on the Pathology and Treatment of Crowing Inspiration in Infants.* By P. Hood, Surgeon.—*London*, 1857. pp. 200.

The opinion of gentlemen engaged in extensive private practice is always worth listening to, although we may miss in their arguments that stringency, and fail to discover in their statements that careful record of pathological details, which are to be expected of those who may have more leisure to devote to the exigencies of modern science. We might object to various points contained in Mr. Hood's book if we were to subject it to a rigid criticism; but we accept it, as we believe it to be intended, as a faithful representation of his experience. We cannot but desire that he should have informed us of the number of cases of scarlet fever which he has attended, in order that we might be able to appreciate the exact value of his statement, that in five-and-twenty years he has lost but two patients from scarlet fever. Our estimate would also be more precise if we knew something of the class of persons among whom Mr. Hood has chiefly had opportunities of watching the effect of his remedies.

Regarding scarlet fever as essentially "a disease of debility," Mr. Hood places his chief reliance upon the employment of quinine; but although he lays great stress upon this agent, he does not neglect the employment of evacuants, and other remedies demanded by the features presented at different stages of the malady.

> "The success of the treatment," he says, "is dependent upon the adaptation, in regular order, of all that is valuable out of the many agents hitherto employed for the cure of scarlet fever by others, and I take no credit to myself beyond the discovery of the most suitable arrangement of these remedies to combat scarlet fever.
>
> "The order of treatment which I adopt is as follows:—1st. Emetics. 2nd. Purgatives. 3rd. Quinine. 4th. Opium. 5th. Wine and diet.
>
> "I have not, for some years, found it necessary to alter this arrangement in treating scarlet fever; nor have I made any difference in the treatment of the disease according to the variety it presented, whether it showed itself as simple scarlet fever, scarlatina anginosa, or scarlatina maligna, beyond the more liberal use of wine, and larger doses of quinine in the last-named form. I have found that one and all are to be safely treated on the same plan, subject, of course, to those modifications as to the strength of medicine and the amount of support which particular constitutions demanded." (p. 74.)

Those who desire to know more of Mr. Hood's views and mode of practice will do well to refer to the book itself, which bears the stamp of having issued from the pen of a shrewd observer. This remark applies particularly to the second part of the book, in which the author discusses the pathology and treatment of crowing inspiration—a disease that is invariably connected with great mal-nutrition. Having, at a post-mortem of a child whom he attended for this affection, discovered "the liver much enlarged, dense in its structure, and double the thickness of a healthy liver;" Mr. Hood subsequently invariably examined the state of the organ in infants labouring under laryngismus, and

> "The result" (he says) "of what I have observed in all cases that have come under my notice, is the conviction that this disease has its origin either from enlargement of the liver taking place, or from derangement of the function of that organ; and that upon the restoration of the liver to a natural size, and the correct performance of its functions, depends the successful treatment of this disease."

The author in thus stating the result of his experience, avoids the question as to whether this "enlargement of the liver is the sole and primary cause of the disease." He expresses the opinion, however—

> "That the former arises from a mal-assimilation of the food; and that the blood thus formed, being of an unhealthy character, facilitates a preternatural growth in this organ [the liver], in the same manner that it occasions enlargement in the glands of the throat."

We have no doubt that Mr. Hood's statement will attract attention, and that the hepatic region of young children will be more frequently subjected to examination than it usually is, in order to verify or refute it. The cases which he details certainly justify the conclusion at which he arrives; but here again, as we remarked in reference to his observations on scarlet fever, it would be more satisfactory were we informed of the number of cases which have fallen under his notice.

ART. XI.—*Summary of New Publications.*

As usual at this season of the year, the number of works accumulating on our library table is very considerable. Many of them are manifestly of high merit, and will receive ampler notice than we are yet able to bestow upon them. Medicine is most largely represented. Dr. Barclay treats of the whole science of pathology in a work entitled, 'A Manual of Medical Diagnosis,' which, with Dr. Aitken's 'Handbook of the Science and Practice of Medicine,' will be specially introduced to our readers in the ensuing number of this Review. We shall then also refer to Dr. Robinson's valuable collection of essays, entitled, 'Contributions to the Physiology and Pathology of the Circulation of the Blood.' The subject of Spinal Irritation has a rational exponent in Dr. Inman, to whose views on the cause of certain painful affections commonly regarded as neuralgic, we drew attention in the April number of last year. Two prize essays on Consumption, by Mr. Edwin Lee, of balneological repute, and Dr. Warren, have reached us from Philadelphia; while Dr. Cotton's well-known volume on the same subject comes before us in a second edition. A specific treatment of pulmonary phthisis is vaunted in a good-sized octavo volume, upon grounds which the author, Dr. J. Francis Churchill, regards as conclusive, but which appear to us far from possessing the necessary stringency. His remedial agents are the hypophosphites of lime, of soda, potassa, or ammonia. We are the more anxious to consider the question dispassionately, as the author makes a wholesale accusation against his English *confrères* of having used him unfairly. Dr. Russell Reynolds favours us with 'Tables for the Diagnosis of Diseases of the Brain,' "constructed for the use of students and others who may find some difficulty in applying their general knowledge of cerebral diseases to the diagnosis of particular cases." The pathology of the alimentary canal is represented by Dr. Habershon's important work on the subject, some parts of which have already appeared in the 'Guy's Hospital Reports.' The third volume of the third series of these Reports is now before us, and contains numerous valuable contributions by the distinguished members of Guy's medical staff. The eighth volume of the 'Reports of the Pathological Society,' is, as usual, replete with interest, and we hope soon to accomplish a desire, some time entertained, of laying before our readers a summary of the progress of pathological science as represented by this very useful and thriving Society. From America we have received the third edition of Dr. Gross's 'Pathological Anatomy,' with which we may notice a work of Professor Valentin's, on the best mode of instituting autopsies, entitled, 'Die kunstgerechte Entfernung der Eingeweide des menschlichen Körpers.' A fifth edition of Dr. Golding Bird's 'Urinary Deposits,' under the auspices of Dr. Edmund L. Birkett, has been published; with which we couple the second number of Dr. Beale's work on the Microscope, illustrating urinary deposits. An interesting volume 'On the Therapeutic Action of Oxygen,' by Dr. Birch, holds out more hope of this agent proving as useful in the therapeutic treatment of disease as its presence is essential to health. Mr. Gardiner Hill, whose name is identified with the introduction of the non-restraint system in the treatment of the insane, supplies us with 'A Concise History of the Entire Abolition of Mechanical Restraint'—an event the vast benefits of which receive constant confirmation in the annual reports of the best conducted asylums for lunatics in this and other countries.

Mr. Hunt, to whom belongs the credit of having proved the value of, and thus introduced into general use, the exhibition of arsenic in the treatment of some forms of chronic skin disease, supplies us with a second edition, which has been almost re-written, of his 'Guide to the Treatment of Diseases of the Skin.' To Dr. Marshall Hall's legacy, 'The Treatment of Apnœa by Prone and Postural Respiration,' we shall devote special and respectful attention in our next.

Under the head of the History of Medicine we have to mention a translation, with explanatory notes, by Dr. Charles Collier, of the account given by Thucydides of the plague of Athens, in which we find a novel view advocated by the author—that the disease was scarlatina maligna.

The subject of epidemics, by a natural transition, brings us to public Hygiene: the Sanitary Reports for Clerkenwell and Islington, respectively by Drs. Griffith and Ballard; the 'Report on Chemical Investigations,' by Dr. Hoffmann and Mr. Will, bearing on the Metropolitan Drainage question, and Mr. Acton's work 'On Prostitution,' deserve special mention.

Surgical literature is enriched by Dr. Adams' beautifully-illustrated work 'On Chronic Rheumatic Arthritis,' by a reprint of the valuable papers of Mr. Teale, 'On Plastic Operations on the Face and Neck;' and of Mr. Butcher's 'Reports in Operative Surgery.'

In Obstetric Science we have received the translation from the German, by Dr. Matthews Duncan, of a chapter of Dr. Braun's new text-book of midwifery, entitled, 'The Uræmic Convulsions of Pregnancy, Parturition, and Childbed;' and a reprint from the American medical monthly, of 'A Case of Fibrous Tumour of the Uterus, accompanied with excessive Hæmorrhage, successfully treated by Excision,' by Dr. Barker, of New York.

Anatomy is represented by a second edition of Mr. Luther Holden's valuable work 'On Osteology,' which is of special use to the student, and probably of as much to the practitioner who wishes to refresh his fading knowledge of the skeleton and its relation to the soft parts. We shall have occasion to revert more fully to two works which have reached us from America, and may be noticed here preliminarily—Dr. Joseph Jones' 'Investigations relative to certain American Vertebratæ,' and Dr. Wynne's 'Report on the Vital Statistics of the United States.'

Mr. Williams' 'Handbook of Chemical Manipulation,' Mr. Galloway's 'Manual of Qualitative Analysis,' with Dr. Bence Jones's translation of Mulder's 'Chemistry of Wine,' represent different phases of Chemical Science, and will command our attention at a future period.

We are glad to announce that Dr. Mayne's 'Expository Lexicon of the Terms, Ancient and Modern, in Medical and General Science,' has advanced another step. The sixth number has just appeared, and carries us from *Neurectopicus* to *Periphacitis*. Mr. Irvine has published what appears to be a very correct account, comprising all the documentary and other evidence, of the recent trial of Miss Madeleine Smith for the alleged poisoning of L'Angelier.

Numerous reprints—some of which we may be able to advert to in our quarterly and half-yearly Reports—various pamphlets and papers —are also before us, the titles of which will be found among the list of Books Received for Review.

We would merely, in conclusion, announce that M. Brown-Séquard has undertaken to edit a physiological journal in Paris, under the title, 'Journal de Physiologie de l'Homme et des Animaux.' As yet only the prospectus of this periodical is before us, but it is scarcely necessary on our part to urge upon our readers that a journal of this kind can scarcely appear under more favourable auspices, or such as would be more likely to ensure it a good welcome by the medical profession of Great Britain.

PART THIRD.

Original Communications.

Art. I.

On the Development of the Eye in the Chick.[*] By Peter Young, M.D., M.R.C.S. Edin., Demonstrator of Anatomy in the University of Glasgow.

Of all the organs of the senses, the eye is the first to present indications of itself. In the chick, observers differ as to the exact period of its appearance. Thus, Huschke[†] states he observed the primitive rudiment of the eye before the termination of the first day; whilst Bär[‡] and others say that it first shows itself at the thirty-third hour; but from a considerable number of embryos which I examined, the period of the commencement of the evolution of the eye would seem to vary, for in some cases it had appeared at the thirtieth hour, while in others not until the thirty-sixth. I am not aware that any exact period has been fixed for the first appearance of the eye in the invertebrate animals, but there can be no doubt that it commences to be developed at a period correspondingly early to that in the vertebrate animals; for although Rathke[§] states that in Daphnia pulex and other entomostraca the eyes first distinctly appear about the middle of embryonic life as two distinctly separated black points, still it is evident from this that the eye in these animals must have been partly developed prior to this period, since—as we shall afterwards see—the choroid does not make its appearance till some time after the formation of the lens. According to Huschke,[‖] the eyes represent at first a simple dilatation or fossa at the anterior extremity of the embryo, bounded on either side by the inner border of the dorsal laminæ. This fossa is soon converted into a vesicle or shut sac by the growth inwards from the two borders or the dorsal lamina of a fine membrane, which closes it. This optic cavity communicates at first with the cerebral vesicle by one opening, but soon the anterior and posterior borders of the optic dilatation approach each other, whilst at the same time the anterior cerebral cell pushes itself forwards between the posterior parts of the optic cavity. By this means each half of the previously simple optic rudiment obtains a more lateral position, and the former single communication is converted into two, which during the further development of the eye become smaller and smaller.

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[*] To the following essay a gold medal was awarded by the University of Edinburgh in 1857.

[†] Ammon's Zeitschrift für die Ophthalmologie. Band iii. p. 342. 1833.

[‡] Valentin's Handbuch der Entwickelungsgeschichte des Menschens, p. 186. 1835.

[§] Abhandlungen zur Bildungs- und Entwickelungsgeschichte des Menschen und der Thiere. Leipzig, 1833.

[‖] Ammon's Zeitschrift fur die Ophthalmologie. Band iii. p. 342. 1833.

On the other hand, Reichert asserts that the eyes arise from differentiated collections of cells, without having any connexion with the medullary tube, and says that the eye in Batrachian animals represents an elevation of a rounded form on either side of the anterior extremity of the embryo, which are very close to each other, and, when viewed from the side, constitute the anterior boundary of the embryo.

All observers, Huschke and Reichert excepted, are, however, now agreed that the eye at first presents itself as a protrusion on either side of the anterior cerebral vesicle; and from the observations of Bär, Rathke, Remak, Vogt, &c., this would seem to hold good for all classes of vertebrate animals. It is difficult to understand why there should have been any discrepancy of opinion with regard to this

Fig. 1.

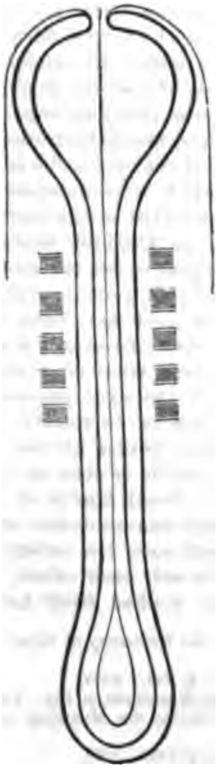
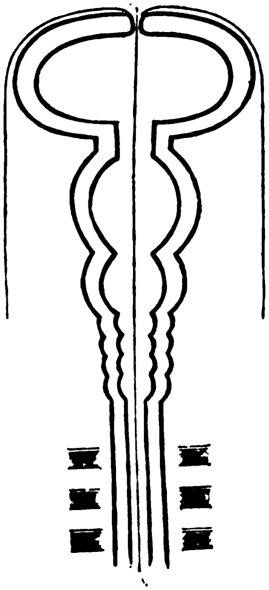


Fig. 2.



point; for in the chick at least it requires no more than ordinary care to perceive the true state of matters. I have examined a considerable number of chick embryoes at all periods up to the formation of this lens, and I have no doubt whatever that the primitive optic vesicle is a protrusion of the anterior cerebral cell. It would be tedious and superfluous were I to describe every embryo which I examined at this period, since no changes are observable in the optic vesicle, except that it increases in size and alters its position somewhat. Accordingly, I shall only describe one embryo, as I observed it at the forty-eighth hour of incubation, with a magnifying power of sixty diameters.

A protrusion (Figs. 1. and 2) is observable on either side of the anterior-cerebral vesicle, the axis of which is at right angles to that of the embryo. These protrusions have distinct, well-defined walls, equal in thickness to those of the cerebral cell, and their apices are apparently in contact with the horny lamina of the embryo. Although the walls of the optic protrusion are quite distinct and readily seen to be continuous with those of the anterior cerebral vesicle, yet they are not so clearly defined as those of the latter, owing to the deposition of a quantity of molecular matter in them. Their cavities are distinctly seen communicating with that of the anterior cerebral cell, and are somewhat, but very slightly, constricted at their junction with that of the cerebral vesicle. No thickening or other change in the horny lamina is observable opposite the outer extremities of the optic protrusions, although the latter, as already observed, appear to be in contact with it. Four cerebral vesicles are also observable. The anterior is broader and shorter than the second, and exhibits a narrow well-marked notch at its anterior extremity. The second is narrower and longer than the first, and separated from it by a well-defined construction. The third is narrower and shorter than any of the preceding; while the fourth is somewhat longer than the second, but is narrower than any of the other three. The walls of the latter present a wavy or zig-zag appearance, there being four notches separated by three intervening ridges on its internal surface, the reverse obtaining on the external aspect. There is no distinct line of demarcation between the cavity of the fourth cerebral cell and the canal of the future spinal cord, but they appear to pass gradually into each other, so that the cerebral cells may be regarded, as indeed they really are, dilatations of the medullary tube.

About this period, the relative position of the optic vesicles and anterior cerebral cell changes. This change in position is occasioned by the development of the hemispheres, which arise from the anterior and inferior wall of the anterior cerebral vesicle by the deposition of matter upon the latter. By this means not only are the optic vesicles inclined somewhat backwards, but, owing to the hemispheres and the floor of the posterior part of the anterior cerebral cell (third ventricle) arching downwards, the latter push the anterior borders of the optic vesicles from each other, whilst the posterior borders come in contact with each other on the floor of the third ventricle, so that the optic vesicles, which were at first lateral protrusions of the anterior cerebral cell, now appear as if they proceeded from the floor of the third ventricle. The inferior or internal portions of the optic vesicles having thus come into contact with each other, coalesce, and form the rudiment of the decussation; but Huschke, in conformity with his views of the development of the eye mentioned above, says that the primitive single vesicle of the eye is divided into two, and that the connecting constricted portion forms the chiasma and the optic nerves. I have not been able to ascertain at what period the optic vesicles lose their communication with the third ventricle, but it would seem that they do so on the formation of the lens. The position of the optic vesicles mentioned above does not last long, for by the growth in width of the base of the brain they become applied with their elongated narrow pedicles to the outer surface of the third ventricle, or, to express it in other words, take up a lateral position behind the hemispheres. Before they assume this position, however, the lens has commenced to develop itself, and I am of opinion that this is determined in part by the formation of the latter.

Arrived at this stage, two interesting phenomena now present themselves, upon the proper interpretation of which our knowledge of the true development of the eye mainly depends. I allude to the lens and the fissure of the eye.

With regard to the formation of the lens, observers have, and, as it would appear, still differ very widely from each other. According to Huschke,* the lens is formed by an involution of the external integumentary system; while Ammon,† after making a number of observations instituted for the express purpose of examining the correctness of Huschke's statements, came to the conclusion that it was not developed after the manner described by him, but that it was evolved from the formative material contained within the optic sac. Gray,‡ in referring to Huschke's view of the formation of the lens, says:

> "I examined the eye at four successive periods between the second and third days—at the forty-eighth, fifty-fifth, sixty-second, and seventy-second hours. I not only examined them laterally, as they naturally presented themselves on removing them from the egg, but both on their dorsal and ventral aspect; and if the lens had been, as he described, an inversion of the integument pressing on the dilated end of the optic vesicle, both of the latter positions would have been most favourable for demonstrating it. The lens is, however, formed in quite a different manner; it is first seen as a rather ill-defined granular mass in the cavity of the optic vesicle itself, containing in its centre a nucleus; this is seen on the first half of the third day. On the third it becomes more distinct, a well-defined line now bounds its margin; between the fourth and fifth days the granules become darker and more aggregated towards the centre, leaving a space bounded by a dark outer line; this is now the capsule of the lens, the inner one the boundary margin of the lens itself. Nor could I ever see satisfactorily any doubling-in of the retina so as to form two layers, for in no position that I put the embryo in each of the several examinations that I made, could I ever detect but a single layer."

I have thought it advisable to give the above extract from Mr. Gray's paper in full, in order to illustrate the great difficulty that exists in coming to a correct knowledge of the formation of the lens; for notwithstanding the very great care with which, to judge from the import of the quotation in question, he has investigated this matter, there can be no doubt, as I hope to be able to show presently, that Huschke was after all correct, and that the lens is a tegumentary formation, and not a production of the formative material contained within the optic sac. The lens begins to be developed at the commencement of the third day by the horny lamina covering the antero- or infero-external extremity of the optic vesicle becoming thickened. That is to say, the thickening of the horny lamina to form the lens does not take place exactly at the external extremity of the vesicle, but at its anterior surface, or taking into account the position of the embryo in the egg, at its inferior surface. All authors, as far as I am aware, describe the lens as forming at the external extremity of the optic vesicle; but, apart from the fact that I have seen it forming at the point above indicated, when we consider the position which the lens and retina subsequently occupy, I think it will be evident that this is not the true state of matters. When, namely, an embryo is examined at the fifty-third hour or thereabout, the optic vesicle, when viewed from behind, presents the appearances already described, and the horny lamina exhibits no alteration. When, however, the same embryo is placed upon its dorsal surface, so as to obtain a front view of it (See Fig. 3), a small round disc is seen lying upon the optic vesicle at its outer extremity, and in the middle of this disc a black dot is sometimes, but not always, perceptible. That a thickening of the horny layer takes place previous to the involuted form which it subsequently assumes there can be no doubt, since the walls of the sacciform lens are invariably thicker than the rest of the horny lamina with which they are continuous. The mode of the formation of the lens, as well as the influence it exerts upon the optic vesicle, will, I think, be rendered evident by the following description of the eye of an embryo which I examined at the sixtieth hour of incubation with a magnifying power of sixty diameters. (Fig. 4).

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* Loc. cit., p. 352. † Idem, p. 361. ‡ Philosophical Transactions, p. 191. 1850.

FIG. 3.

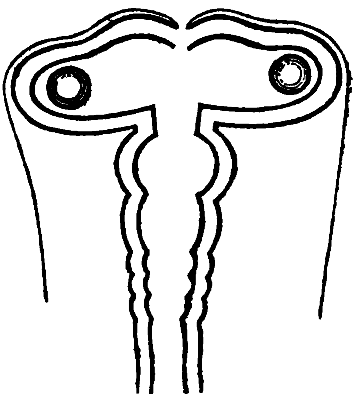
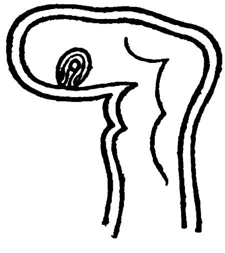


FIG. 4.



At this period the cephalic extremity of the embryo presents a considerable curvature downwards, so that when it is taken from the egg and laid upon a glass plate, it assumes a lateral position. On placing the embryo so situated under the microscope, a lateral view of the eye was obtained. It is oval or pyriform in shape, the broader end being directed upwards and somewhat backwards, the narrower downwards and somewhat forwards, and rests upon the middle brain immediately behind the hemispheres. On carefully examining it, it is seen to be composed of three rings, if I may so speak, two of which, external, and giving the eye its shape, are incomplete and continuous with each other at the inferior part, whilst the central one is perfectly circular and complete, and incloses a small cavity (Figs. 5, 6). This central ring is evidently the lens, while the two external incomplete rings are the previously simple optic vesicle altered and modified by the formation of that structure. Of these two rings, the more internal may, for the sake of clearness, be called the involuted, and the other the non-involuted portion of the optic vesicle. But to describe the rudimentary eye more minutely, and in order to render this easier, I shall first describe the lens, and then the two incomplete rings which surround it. About the centre of the eye, but if anything rather towards the narrower or lower extremity, there is observable a round hollow body, of a different appearance from the other structures of the eye surrounding it. The walls of this hollow structure are somewhat obscured by their granular appearance, although they can be seen with sufficient distinctness to inclose a central cavity. They are about one-fourth thicker than either the non-involuted or involuted portion of the optic vesicle, and are nearly equal to the diameter of the cavity inclosed by them. When the microscope is brought into focus on the surface of the lens, a circular aperture, about an eightieth of a line in diameter, is observable near, but somewhat inferior, to its centre. It may here be remarked, that the position of this aperture is liable to vary, sometimes being central, sometimes, as in this instance, more or less eccentric. The lens is directly surrounded by the involuted portion of the primary optic vesicle, except at the inferior third of its circumference, where both portions of the optic vesicle are awanting, constituting in fact the fissure of the eye, to be more particularly noticed hereafter. With regard to the optic vesicle, the involuted portion, as mentioned above, is in immediate contact with the lens in the upper three-fourths or four-fifths of its circumference; for, arrived at the inferior circumference of the lens, it leaves it, and proceeds downwards to the inferior extremity of the eye, where it turns outwards, and is continued into the outer or non-involuted part of the optic vesicle. As the involuted portion of the optic vesicle converges somewhat in its progress downwards from either side of the lens, a triangular space results, the base of which is formed by the lens, the sides by the descending crura, if I may so speak, of the involuted portion of the optic vesicle. The outer or non-involuted portion of the optic vesicle, commencing at the inferior extremity of the eye,

FIG. 5.

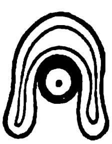
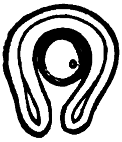


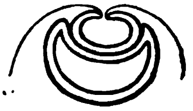
FIG. 6.



where, as we have seen, it is continuous with the inner involuted portion, proceeds upwards in contact with the latter as far as the superior circumference of the lens, but here leaves it, and mounts upwards to the superior border of the eye, which indeed it alone constitutes. It then descends on the other side of the eye, again comes in contact with the inner involuted portion at the superior border of the lens, and pursues its course downwards to the inferior extremity of the eye, where it becomes continuous with the inner portion at the side of the fissure opposite to that from which we commenced to describe it. The space thus formed at the superior extremity of the eye is semilunar in form, and is a portion of the cavity of the primitive optic vesicle, but it is soon obliterated by the two portions of the latter coming in contact with each other. The involuted and non-involuted portions are nearly of equal thickness, and this is of the more importance to observe, since, as we shall afterwards see, the inner portion subsequently attains an enormous relative thickness.

Such was the appearance presented by the eye at this stage when seen from the side. When now the embryo was placed upon its ventral surface, which, owing to the great curvature of the head, requires some care and perseverance to effect, a view of the eye was obtained completely explanatory of the origin of the lens. The lens—namely, of an elliptical form, and composed of thick, distinct walls, inclosing an elliptical cavity, and covered at its free surface by an attenuated portion of the horny lamina—is seen lying in a socket or inversion of the outer wall of the optic vesicle (Fig. 7). That the socket in which the lens is lying is really an involuted portion of the optic vesicle is proved, firstly, by their being separated from each other by a distinct line of demarcation; and, secondly, by the fact that it is seen to be continuous with the outer non-involuted portion at the margin of the lens. In the outer or free wall of the lens a canal, equalling in diameter that of the aperture seen on the surface of the latter when viewed from the side, is observed running from the cavity to the free surface, so that the cavity of the lens is continuous with the horny lamina covering the surface of the embryo. The involuted portion of the optic vesicle was not in contact with the non-involuted part, except at the place above-mentioned, but was separated from it by a semilunar space—the altered cavity of the primitive optic vesicle.

FIG. 7.



Thus, then, there can be no doubt, I think, that the lens is a product of the tegumentary system, and that it is formed partly by an involution, partly by a thickening of the horny. Schoeler,[*] while admitting that the lens is developed from the tegumentary system, maintains that the lens is alone formed by a solid growth of the horny lamina, and that the cavity with its surrounding walls, as described above, is a secondary phenomenon, dependent on the differentiation of the primitive solid growth. That this is not the case is abundantly proved by the existence of a distinct aperture on the surface of the lens; but it must be observed that this aperture does not persist long, so that if the embryo be not examined at a sufficiently early period, very indistinct, or no trace of it will be discoverable.

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[*] Remak, Entw., p. 72.

Having thus seen how the lens is formed as a whole, let us next inquire in what manner the capsule and the fibres of the organ are developed. When the lens of an embryo at the fifth or sixth day of incubation is examined, it is seen to be made up of three concentric portions — an outer, middle, and central. The latter corresponds to the cavity described above as existing at the first formation of the lens, whilst the two former correspond to the simple wall which enclosed that cavity; or, to express it in other words, the latter has now become differentiated into two, of which the outer represents the future capsule of the lens, and the inner, with the central portion, the lens itself. The capsule presents a more homogeneous and clearer appearance than the lens, which is decidedly granular, and not marked off from the central portion by a distinct line of demarcation, but passes insensibly into it. At first the lens, as was first pointed out by Valentin,* in a sheep embryo six lines in length, consists of large round vesicles like oil-drops, between which there are small corpuscles disposed in a scutiform manner. Kölliker† found the lens in a sheep embryo seven lines long to be entirely composed of small nucleated cells, and in a human embryo eight or nine weeks old, the whole lens was made up of delicate fusiform cells. The large vesicles, first described by Valentin, would seem to have a very short existence, for although they are readily seen at the end of the first week, I have not been able to see them at the commencement of the third. In the second week, the fibres of the lens appear in the centre, and are surrounded by the corpuscles above mentioned. According to Valentin,‡ the fibres arise by these corpuscles arranging themselves in a longitudinal direction, and coalescing; so that even in the adult, traces of constrictions are visible on their walls. It is to Meyer,§ however, that science is indebted for the true explanation of the manner in which the fibres of the lens are formed. According to him, the lens of newly-born animals presents a disc-shaped lamina situated in the equatorial plane. It exhibits a turbid, milky appearance, contrasting strongly with the clear aspect of the remaining portions of the lens. This lamina, however, is not straight, but presents a slight convexity towards the anterior section of the lens. This disc, to which Meyer gives the name nuclear zone (*kernzone*), is composed of a collection of the nuclei of the fibres of the lens. On hardening the lens of a newly-pupped dog by boiling, Meyer made a thin section corresponding to the equatorial plane of the lens. When this had been rendered transparent by the addition of acetic acid, the part corresponding to the nuclear zone represented itself as a band 0·3324—0·0166 of an inch in width, extending from the sharp border of the one side of the lens to that of the other side, and at the same time exhibited a slight convexity towards the anterior aspect of the lens. This nuclear zone was composed of nuclei included in the fibres of the lens, and what is of more importance, only a single nucleus appertained to each fibre. Important differences were observable among the individual nuclei, those of the outermost laminæ being oval (0·0063—0·0090 of a line long, and 0·0032—0·0048 of a line broad), possessing one to two nucleoli 0·0012—0·0016 of a line in diameter, and being clear and smooth at the edges; further inwards, no nucleoli were any longer observable, and the nuclei themselves had a turbid and shrunk appearance. Their contours gradually passed from the oval to the circular form, and their diameters gradually decreased until they appeared as so many points. In the centre no nuclei were observable in the fibres.

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* Handbuch der Entw., p. 203. 1835.

† Mikroskopische Anatomie, Band ii. p. 730. 1854.

‡ Loc. cit.

§ Müller's Archiv, p. 202. 1851.

Kölliker* has confirmed the observations of Meyer, and pointed out a very curious circumstance—namely, that in newly-born animals at least, as well as in adults, the cells of the inner surface of the capsule furnish the materials for the formation of the fibres of the lens. All these cells, however, are not concerned in the formation of the organ, but, as Meyer correctly states, only those of the free border of the epithelium. The process of the formation of the fibres of the lens is thus described by Kölliker:

> "The outermost cells first become prolonged backwards in the direction of the meridian of the lens; at the same time they become flattened and thin, when they occupy a more or less oblique position—also grow forwards, and thus come to lie with their anterior extremity on the inner side of the epithelium."

As this process goes on, the fibres so formed are pushed inwards by the formation of other cells, and ultimately assume the usual characters of the fibres of the lens. From this, then, it would appear that each fibre of the lens is, so to speak, a single enormous cell, the nucleus of which remains stationary at the equator of the lens. According to Kölliker,† Leydig has also found the same to hold good in fishes, so that in the vertebrate animals at least it would appear to obtain universally.

Having thus traced the development of the lens as far as the limits of this paper will allow, let us retrograde a little, and inquire into the cause of the fissure so frequently referred to above; and as I believe we shall find this in the manner in which the vitreous humour arises, I shall in the first instance notice the various views entertained by different observers of its mode of formation, and then proceed to describe what I myself have observed.

With regard to the fissure, V. Bär‡ is of opinion that there is no real fissure, and states that

> "The middle of the projecting borders of the fold is thin, but presents distinct continuity. Close beside the attenuated stripe the retina is thickened so as to form two swellings. The choroid beneath this fold contains no pigment, is not, however, interrupted, but forms a continuous membrane which can be

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* Loc. cit., p. 731.

† Loc cit., p. 733.

‡ Entwickelungsgeschichte, Band i. pp. 77, 106.

separated as such from the sclerotic. Subsequently, however, the choroid passes into the fissure, and ultimately, at the termination of embryonic life, passes through the fissure as a prolongation, and forms the pecten of the eye of the bird."

According to Huschke,* the fissure coincides in its formation with the first appearance of the eye. He thus describes its origin:

> "The posterior border of the optic dilatation, which formerly ran parallel with the anterior border, obtains a direction which is convex anteriorly, and, as also in part, the inferior border, which runs obliquely from below, and from within upwards and outwards. Towards the middle, on the other hand, it is inclined chiefly towards the inferior part of the optic fossa, and then the fissure of the eye arises out of the previous communication."

Bischoff, and with him Gray,† are of opinion that

> "The fissure is connected with the separation which is effected between the ocular vesicle and the peduncle by which it is connected with the cerebral cell, the fissure at first being wide, and extending as far as the anterior part, at its inferior and inner side; but as the tubular portion of the protrusion becomes more solidified and connected into the true optic nerve, the fissure becomes much narrowed."

The fissure appears to occur in all vertebrate animals, and has been seen in them by Malpighi, Kuhlemann, Haller, Wusberg, Autenrieth, Sömmering, Meckel, Emmert, Carus, Treviranus, Huschke, Ammon, Müller, Gescheidt, Valentin, &c.;‡ but Rathke§ could not perceive a trace of it in the Blennius viviparus.

With respect to the formation of the vitreous humour, various opinions have likewise been entertained. Bär|| remarks:

> "The vesicle of the retina does not possess so thin contents as the cerebral vesicle, but a thick albumen, which after being treated with alcohol, can be separated entire."

And in another place says:¶

> "The fluid part of the constricted optic vesicle becomes thicker and thicker, and coagulates partly at the place where the eyeball adjoins the outer surface of the embryo to form the crystalline lens, but inwards from this part to form the vitreous humour."

Huschke,** in speaking of the formation of the vitreous humour, says:

> "There runs from the cerebral vesicle as a continuation of it a canal, which dilates itself anew, in order to expand the retina and convey thither the same fluid which fills the cerebral cells, and which in the adult merely moistens the inner surface of the cerebral cavities. This becomes transformed in the eye into the vitreous humour, and, as is well known, retains thereby, especially in the fluid vitreous humour of the lower vertebrate animals, much the same consistence and chemical properties. In the early embryo also it is enclosed by no special membrane, a covering being just as little perceptible on it as on the cerebral cavities. If, now, the retina be the analogue of the roof of the cerebral cavities, and the vitreous humour that of the serum of the brain, the assertion would not be extravagant that the hyaline membrane corresponds to the epithelium of the ventricles or to the lamina medullaris, and is the continuation of this into the eye. The vitreous body is *ein in Zellen Krystallisirtes Hirnwasser.*"

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* Valentin, loc. cit., p. 187.

† Loc. cit., p. 192.

‡ Loc. cit., p. 193.

§ Loc. cit.

|| Loc. cit., Band i. p. 77.

¶ Loc. cit., Band ii. p. 114.

** Ammon's Zeitschrift, Band iii. p. 349.

Ammon* concurs with Bär in his opinion of the origin of the vitreous humour, maintaining as he does that the fluid contained in the primitive optic vesicle not only forms by its differentiation the vitreous humour, but also the lens. Valentin† says: "The vitreous humour appears to be a metamorphosis of the fluid no longer employed for the formation of the retina;" and adds: "With regard to the mode of its origin we are still completely in the dark." According to Kölliker,‡ Schöler discovered that the vitreous humour was not formed within the primitive optic vesicle, but external to this, between this and the lens, and not only so, but was a production of the skin, passing beneath and behind the lens into the secondary optic vesicle. Remak concurs with Schöler. Mr. Goodsir§ is of opinion that the vitreous humour develops itself between the lens and the primitive optic vesicle, but in a different manner from the preceding. He says:

> "The original bulb of the eye, whether it be a mere process of the brain, or, as he is inclined to believe, partly a pulp developed on the tegumentary membrane, forms over its entire free surface transparent (cuticular) structures. That portion of the free surface of the pulp which is directed towards the orifice of the eye follicle develops the lens, the cornea, and the vitreous humour. That portion again, in contact with the inner surface of the follicle, and which becomes choroid, develops the bacillary layer with its rods and cones. As the lens and vitreous humour increase in size, the pulp or retina becomes cup-shaped and intermediate between the two portions of the transparent structure developed from its original spheroidal surface."

Such are the various views which have been expressed by observers, as far as I have been able to collect them, with regard to the formation of the vitreous humour; and I have thought proper not to make any critical remarks on them, as my own views on the subject will be more conveniently given in the following relation of some observations which I made with reference to this point. And, firstly, I may premise that my observations lead me to agree with Schöler—with this difference, however: that the vitreous humour is not a tegumentary formation in the same sense as the lens is; that the vitreous humour is not a growth from the horny lamina: that it is, in short, a subtegumentary formation. This receives no small support from the circumstance that Bowman‖ and Virchow¶ found that the vitreous humour of newly-born children presents a very distinct and peculiar fibrous structure, consisting of a dense network of fibres which, at the points of junction, possess dark, nucleated corpuscles, with, according to the latter observer, an homogeneous—in some places, slightly striated—muciferous substance between them. The vitreous humour in young subjects would thus appear to be a kind of muciferous areolar tissue, and we shall see immediately that it has the same developmental value. It was remarked above, when speaking of the lens, that the latter does not merely push back the outer surface of the primitive optic vesicle, but that, in conjunction with this, it pushes the optic vesicle from below upwards, and thus gives rise to the double ring of the latter surrounding it, and, as a necessary consequence, to the fissure at the lower part. From careful examination, however, I have satisfied myself that, while the lens has some share in the formation of the fissure, I have equally satisfied myself that it does not give rise to the whole of it. While, therefore, the fissure—or, rather, a part of it: that part, namely, at the free surface of the eye, and which is seen when the surface of the eye is examined from the side—appears contemporaneously with, and is caused by, the formation of the lens: the internal or deeper portion is not formed until a few hours subsequently. It is difficult to say when the vitreous humour commences to evolve itself; but I think I am not far wrong when I state that it does so about the fifty-eighth or sixtieth hour—i.e., when the eye presents the appearances described above when treating of the lens—for although I did not observe it in that embryo, I have seen it in others at an equal stage of development. When an embryo such as that above referred to is placed under the microscope, and the focus of the instrument is brought, not on the surface, but on the deeper parts of the eye, a fissure is seen similar to that described above, of which, indeed, it is the continuation inwards. On careful inspection, and with the aid of careful focussing, it is seen that this fissure is of no great depth — not measuring so much from above downwards as that portion beneath the lens—and that it is bounded at the sides by a double lamina, but superiorly by only a single one. The inner lamina is evidently an involuted portion of the optic vesicle resembling the inner incomplete ring immediately surrounding the lens, for it can be traced into the outer at the lower margin of the fissure. The superior border of the involuted portion does not, at this period, extend so high as the inferior border of the lens; but subsequently it extends higher than this, and does not cease in its progress upwards and backwards until it has reached the superior and posterior walls of the optic vesicle. Of course the whole process of this inversion cannot be seen by merely examining the eye in the manner above indicated, and in order to this it is requisite to make sections—especially antero-posterior ones—of the organ. I may here remark, that on more than one occasion when examining the eye from above—the embryo being placed on its ventral surface—I have seen the involuted portion of the optic vesicle, which, when the embryo was inspected immediately on taking it from the egg, lay in direct contact with the posterior surface of the lens, recede from the latter, so that a clear semilunar space was left between the two. This separation was apparently owing to the rapid evaporation from the exposed surface of the embryo; and had I not observed the formation of the semilunar space, I would have been very apt, as perhaps others have, to regard this as the first indication of the vitreous humour. The fissure—or rather the cavity of the secondary optic vesicle—is filled with a granular, slightly-striated blastema, continuous with that surrounding the eye, of which, indeed, it forms a part. The

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* Loc. cit., p. 361. † Loc. cit., p. 197. ‡ Loc. cit., p. 728.
§ Edin. Month. Journal, 1854. ‖ Lectures, p. 97. ¶ Virchow's Archiv, Band v. p. 278

FIG. 8.

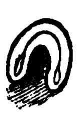
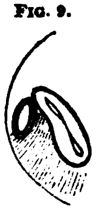


FIG. 9.



fissure in the farther progress of development becomes narrower, but is observable, up to near the termination of embryonic life, by the black pigment of the choroid being deficient at that part—the closure taking place from before backwards just as it forms in the same direction. It exists permanently in the eye of the cod, but only implicates the retina, the other tunics being entire; for it is a circumstance worthy of remark, that the coats of the eye close from without inwards, apparently in conformity with the general law that structures of higher organization are more difficult of repair than those which belong to a lower type.

Besides the interest which attaches to the fissure merely as a developmental phenomenon, it is also worthy of attention as explaining the occurrence of that rather rare malformation to which the name Coloboma has been given. For an account of this condition I may be allowed to refer to Gescheidt's* and Hannover's† descriptions of it in individuals in whom they had an opportunity of examining the eye after death.

Contemporaneously with the formation of the fissure, a similar process takes place in the hollow pedicle, the latter being transformed into a double-walled groove, or incomplete tube, by the surrounding tissue pushing the lower wall upwards against the upper wall. The fissure so formed is just a continuation of that of the eye itself, its involuted portion being continuous with the involuted portion of the optic vesicle, and the non-involuted part with corresponding lamina of ocular vesicle. By this means we obtain an explanation of the otherwise remarkable sudden expansion of the optic nerve to form the retina, and at the same time of the position of the large artery of the retina, which, as is well known, occupies the centre of the optic nerve, and in the embryo passes forwards through the vitreous humour to the posterior surface of the lens. The fissure of the optic nerve closes about the fifth day, when the choroid begins to appear; and since the changes which subsequently take place in it do not concern us in our present inquiry, we shall dismiss the subject with this brief notice of its development.

It will be remembered that the eye in the embryo described above was pyriform, or oval, and that this was owing to the prolongation downwards of the walls of the optic vesicle forming the sides of the fissure. This shape, which is generally assumed about the fifty-fifth hour, continues up to about the fifth day. At this time, the walls bounding the fissure, instead of being double, as heretofore, become single; for, contemporaneously with its closure by the approximation of its bounding walls, the latter reach the equator of the eye; and when this has been effected, the pupillary border of the secondary optic vesicle is no longer pyriform, but circular. When the eye has assumed this form, the rudiments of all its coats have been laid down, with the exception of the iris; and, owing to the deposition of the black pigment of the choroid, the examination of it is rendered somewhat difficult. It will be convenient to examine the development of the different coats in the following order:—I. The retina. II. The choroid. III. The sclerotic and cornea. IV. The pupillary and capsulo-pupillary membranes.

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* Ammon's Zeitschrift, Band iv. p. 436.

† Muller's Archiv, p. 482. 1845.

I. With regard to the retina, we have seen that the primitive optic vesicle, owing to the formation of the lens from the horny lamina, and of the vitreous humour from the blastema surrounding it at the inferior circumference, is obliterated, and a secondary one formed, which, unlike the primitive, possesses double instead of single walls. At the commencement of the formation of the latter both walls are of equal thickness, but soon, and before the involution is completed, the inverted portion becomes thicker than the outer. This excess in thickness of the inner over the outer wall goes on increasing till the former is four or five, or even more, times thicker than the latter. This great disproportion is increased by the remarkable circumstance that the outer decreases in thickness, so that when the pigmentary matter of the choroid is deposited, it can only be seen as a delicate lamina beneath that membrane, and continuous with the inner lamina of the secondary optic vesicle at the margin of the lens. Remak,* indeed, maintains that this outer lamina takes no part in the formation of the retina, but is converted into the choroid. This strange metamorphosis is not what we should *à priori* expect; and accordingly, in a number of embryos which I examined after the appearance of the choroid, with special reference to this point, I found, as stated above, a thin lamina immediately beneath the choroid, which, at the margin of the lens, was seen to be continuous with the thick inner lamina of the optic vesicle. From this I am inclined to believe, with Huschke, and other observers, that the inner lamina forms the retina proper, while the outer forms the bacillary layer. Kölliker is inclined to concur with Remak, not from direct observation, but from the relation of the bacillary layer to the other laminæ of the retina, as first pointed out by H. Müller—the relation, viz., that the rods and cones do not form an isolated lamina upon the surface, but are continued inwards to the membrana limitans, by means of Müllerian fibres, as they are called. While this may be adduced as an argument in favour of Remak's view, it may, with equal propriety, be brought forward in support of the other; for admitting, as Müller and Kölliker believe, that the Müllerian fibres are the united processes of the cells constituting the different layers of the retina, it is evident that the cells composing the outer layer of the optic vesicle may, from its close contact with the inner, readily send processes inwards; and further, the circumstance that in the fully-developed retina the bacillary layer readily detaches itself from the rest of the retina, is, I think, decidedly opposed to Remak's view that the inner involuted portion of the optic vesicle alone forms the entire retina. Rathke, who supposes that the involuted portion of the optic vesicle is absorbed, as he never observed it to come in contact with the outer portion, says:

"Like the wall of the greater part of the brain, that of the eye, so far as it can be regarded as an appendage of the former, becomes distinctly differentiated into two different layers, of which the one appears as a continuation of the nervous layer of the brain, the other a continuation of the membranous layer of that organ."

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* Loc. cit., p. 72.

This view is, in my opinion, untenable, inasmuch as it is an incontrovertible fact, that the involuted portion forms a part at least of the retina; and it is easy to imagine how Rathke, believing, as he did, that the involuted portion was absorbed, should not have perceived the thin lamina beneath the choroid, and have mistaken the thick involuted portion for the outer part of the optic vesicle. Mr. Goodsir, who does not coincide with Kölliker as to the nervous nature of the bacillary layer and of the Müllerian fibres, holds, as we have seen, that the rods and cones are cuticular structures deposited upon the bulb of the eye. Be this as it may, I am certain that the outer portion of the optic vesicle takes part in the formation of the retina, and, from what I have seen, I am inclined to believe that it forms the bacillary layer. We hold, therefore, that the secondary optic vesicle is all expended in the formation of the retina, the inner lamina forming the retina proper, the outer the bacillary layer, with its rods and cones. Whether, as Kölliker maintains, the rods and cones are nervous structures, I do not pretend to say; but certainly the mode of their development seems to countenance such an idea, although it must be admitted they do not, as pointed out by Mr. Goodsir, present the microscopic characters of nervous tissue.

The retina continues to increase in thickness, and assumes a flocculent aspect. It is not, however, equally thick in all its extent, but that portion lying upon the ciliary processes becomes very thin, and ultimately constitutes the pars ciliaris retinæ, as described by Kölliker. Rathke states that the retina not only extends as far forwards as the margin of the lens, but "passes into a very delicate membrane lying upon the posterior half of the capsule of the lens." I am not aware that any other observer has seen anything similar to this, and certainly I never have myself.

II. The choroid, as has been more than once remarked, appears about the fifth day by the deposition of a brownish-black granular matter, in the tissue immediately in contact with the retina. We have already become acquainted with Remak's and Rathke's views of the developmental value of this membrane, and accordingly they need not be brought forward here. The deposition of the pigment first commences anteriorly at the margin of the lens, and proceeds backwards to the fundus of the eye. According to Valentin, round, colourless, transparent corpuscles are first deposited, which are the future pigment cells. Pigment granules of a black colour are soon deposited at their periphery, so that the cells are colourless and transparent in the middle, but dark and opaque at their periphery. The choroid at this period presents a beautiful appearance when placed under the microscope, appearing as if it had been perforated uniformly by a very fine needle, or as the spaces as well as the bounding dark lines subsequently become polygonal—generally hexagonal or pentagonal—exhibiting a honeycomb aspect. These apparent apertures or clear points evidently correspond to the colourless non-pigmentated centres of the cells. The pigment granules are at first exceedingly minute, and when set free in water, exhibit active molecular movements. The cells soon become filled with pigment, so that they cannot be seen till the pigment has been removed to some extent. The vessels of the choroid appear at a subsequent period, but I have not watched their development. On examining the eye of an embryo at the end of the first week without the aid of the microscope, a dark ring, interrupted inferiorly, is seen surrounding the lens. At first sight it would seem as if the iris had been already formed, but on microscopical examination it is observed to be only the anterior extremity of the choroid. When the eye is removed from its socket, the interruption at the inferior circumference is seen extending backwards to the optic nerve. At the end of the second week, the deficiency of the pigment of the choroid can still be traced from the pupillary border backwards to the optic nerve, but the anterior part is almost if not actually filled up, being indicated only by a line, while the posterior part is still wide. There is one curious circumstance connected with this, and that is, that the transition between the closed and unclosed portions is very abrupt, the commencement of the one and the termination of the other being marked out by a curved line, the concavity of which looks towards the optic nerve. The fissure does not close entirely till the termination of the period of incubation, and in some cases not till a later period. The ciliary processes make their appearance about the eighth or tenth day, and, as Ammon first pointed out in the eye of the human embryo, are occasioned by a puckering, as it were, of the choroid around the lens. As they are placed in a radiated manner around the lens, the spaces between the folds are wider at their circumference than at the margin of the lens; but this is in some degree compensated by the bifurcating of the folds.

III. *Sclerotic and Cornea.*—The former is present at a very early period, and is formed from the blastema surrounding the optic vesicle. At first both coats are exceedingly thin and equally transparent, and so closely do they resemble each other up to near the end of embryonic life, that it would be almost impossible to distinguish them from each other were it not that the anterior margin of the choroid indicates where the one terminates and the other commences. The sclerotic can scarcely be said to exist as a separable lamina till about the fifth day, when the choroid has made its appearance, while the rudiments of the cornea, properly so called, are formed at a still later period. When an embryo, namely, is examined, at the fifth day of incubation, from behind, the embryo lying upon its ventral surface, the lens is seen covered by a thin lamina continuous with the horny lamina, of which, indeed, it is merely a part. But this is evidently not the future cornea, for at either side of the lens a triangular portion of tissue continuous with that surrounding the eye,—in other words, with the sclerotic, is seen growing inwards between the horny lamina and the anterior surface of the lens. This process continues till the whole of the horny lamina is raised from the lens, so that the horny lamina comes to occupy the position of the epithelium covering the anterior surface of the cornea, while the cornea proper is merely a prolongation forwards of the sclerotic. At this early period the chamber of the eye does not exist, the anterior surface of the lens being intimately united with the posterior surface of the cornea, and it is not until some time after the iris has begun to develop itself that the lens separates itself entirely from the cornea. From this it follows that the cornea is not a tegumentary structure in the same sense as the lens is, its epithelium only having the same developmental value. With the further growth of the eye, the sclerotic and cornea grow thicker, and assume more and more the characters they possess in the adult. Whether the sclerotic is deficient at the fissure of the eye at the period when it first exists as a separable membrane I do not know, but if so, it must close at a much earlier period than the choroid, for at the end of the second week, when the fissure of the latter is still persistent, it may be traced over it as a distinct membrane.

IV. *Pupillary and Capsulo-pupillary Membranes.*—The capsulo-pupillary membrane was first discovered by W. Hunter. He says:

> "The artery of the crystalline capsule does not terminate at the great circle of that humour. Its small branches pass that circle, and run a very little way on the anterior surface of the crystalline humour before the points of the ciliary processes; then they leave the humour, and run forwards, supported on a very delicate membrane, to lose themselves in the membrana pupillæ."*

This observation would seem to have been lost sight of till J. Müller discovered it anew. According to Henle†, it arises along with the pupillary membrane from the anterior surface of the iris; from here it proceeds backwards, without being connected to the neighbouring parts, to the posterior chamber of the eye, and becomes connected with the anterior surface of the capsule of the lens at the part where the inner part of the zonule of Zinn is situated. But it does not stop here, but proceeds to cover the posterior surface of the capsule of the lens. The lens is thus enclosed in a shut sac, to which Valentin has given the name capsulo-pupillary sac. In young pig embryos, according to Henle, the lens is enclosed in a vascular capsule, the anterior surface of which is in contact with the posterior surface of the cornea. When now the iris begins to grow from the anterior extremity of the choroid and the lens to recede from the cornea, the anterior part of the sac is impinged upon by the iris, and so gives rise to the pupillary membrane, and to its continuation backwards, the capsulo-pupillary membrane. Valentin‡ and Reich have confirmed these observations, while Arnold denies the existence of a capsulo-pupillary membrane. Of course he admits the existence of the vascular expansion on the posterior surface of the capsule of the lens, but denies that it is continued forwards to the anterior surface of the iris. He adduces the following reason, among others, for its non-existence:

"The hyaloid membrane is attached so firmly to the circumference of the lens, that they cannot be separated from each other, even by maceration; and not only so, but it also covers the anterior surface of the capsule. How is it possible, then, that a membrane can pass between the capsule of the lens and the insertion of the hyaloid membrane to the posterior wall?"*

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* Medical Commentaries, p. 63. 1777.

† De Membrana Pupillari. Bonn, 1832.

‡ Loc. cit., p. 202.

I am sorry to say, that after many investigations, I have been unable to see the capsulo-pupillary membrane in the chick embryo. However, as the eye of the latter is not well adapted for its detection, and as I have been unable to obtain mammalian embryos, I must content myself with the above brief notice of it.

The principal results which we have arrived at in the investigation into the development of the eye may be briefly set down under the following propositions:

1. That the eye, as it primarily presents itself, is a lateral protrusion of the anterior cerebral cell.
2. That owing to the development of the lens and of the vitreous humour, the cavity of this protrusion is obliterated, the lower and anterior walls being pushed upwards and backwards against the superior and posterior walls, so that a secondary cavity, or the secondary optic vesicle, as it is called, is produced.
3. That the whole of the optic vesicle, both the involuted and non-involuted portions, go to form the retina, and that the latter probably gives rise to the bacillary layer.
4. That the lens is an involution of the horny lamina, and that while it pushes the optic vesicle from without inwards, it principally acts from below upwards.
5. That the vitreous humour is a sub-tegumentary formation, and is, with the lens, the cause of the formation of the fissure of the eye.
6. That the choroid and sclerotic are formed from the blastema surrounding the optic vesicle.
7. That the cornea is a continuation forwards of the sclerotic, and that its epithelium only has the same developmental value as the lens.

ART. II.

An Experimental Inquiry into the Function of the Supra-Renal Capsules, and their supposed Connexion with Bronzed Skin. By GEORGE HARLEY, M.D., F.C.S., of University College, London.

THERE are a number of organs in the body that have very generally received the name of "ductless glands." The term gland being applied to them, not on account of their being known to possess any secretion, but simply from the fact of their microscopical structure resembling in many respects that of the ordinary secreting organs.

With regard to their functions, it may be said that nothing is as yet positively known. And it is easy to understand why this should be the case, when we remember that they possess no duct, and consequently their secretion cannot be obtained for analysis, the only direct channel by which we arrive at a knowledge of the special function of any secreting organ. It is true that other methods of investigation are open to us, but these unfortunately are the least perfect, and most circuitous. Moreover, they have frequently been employed by different observers, and invariably yielded only negative results. In this, as in every other department of medical science, much has been written upon what was least understood. We consequently find many theories in circulation regarding the functions of these organs. Take, for example, the supra-renal capsules, which are now about to occupy our attention, and we shall find that they have been at one time or other, agreeably to the fancy of the author, appended to the vascular, nervous, urinary, and sexual systems. Theorists had here ample scope for their talents, there being few facts connected with the history of these organs to lay hold of; they worked in the dark, and the result of their united labours has been the retardation instead of the advancement of science. Fortunately for the present generation, the members of the hypothetical school of medicine are fast dying out, and their ranks are being recruited from among those who can thoroughly appreciate the relative value of fact and theory. In proof of this latter statement, we need only to look at the manner in which the function of the supra-renal capsules has, both at home and abroad, been lately investigated. Instead of men seeking facts in the support of theory, theory has been made altogether subservient to fact. And although, notwithstanding this critical investigation, the function of these organs has not yet been unveiled, many important physiological and pathological facts have been added to their literature.

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* Ammon's Zeitschrift, Band iii. p. 37.

To Dr. Addison is due the merit of having attracted the attention to, and stimulated men to inquire into the nature of, the supra-renal bodies. It was after the perusal of his interesting monograph that I, like others, was tempted to try to discover their function. The following paper is the result of the investigation.

In order to make the subject of my communication as concise as possible, I shall divide it into four parts, namely—

1st. The histology of the supra-renal capsules.
2nd. Their chemical composition.
3rd. The effects of their removal from healthy animals.
4th. Their pathology.

Morphology of the Supra-renal Bodies.—On making a transverse section of the supra-renal capsules, they are seen by the naked eye to be composed of two differently coloured substances; the external cortical substance being of a yellow colour, and sometimes marked with perpendicular striæ; the internal or medullary part, of a slate or reddish-brown hue, and pierced with large openings. These openings are the mouths of the venous sinuses. On a thin section of the cortical portion being placed under the microscope, it is seen to be composed of a large quantity of yellow coloured cells, arranged in irregularly-sized rows, placed perpendicularly to the surface, and imbedded in a fibro-areolar matrix. In the human supra-renal capsule, the fibrous nature of the cortical substance, as well as the direction of the fibres, is occasionally sufficiently well marked to be visible to the naked eye on simply tearing or breaking it across.

If the individual cells constituting the rows be examined, they are seen to resemble in size and general appearance the cells lining the uriniferous tubes of the kidney, except that they usually possess a much darker colour. They consist of a homogeneous cell wall filled with variously sized granules, the greater part of which are deeply tinged with yellow pigment. The cells in general contain a considerable quantity of fat, and possess a nucleus, although it is not always visible without the application of reagents. When floating free in the field of the microscope, the cells appear irregularly round, but when grouped together in masses, they have a somewhat polygonal form. In order to study their arrangement in the fibro-areolar matrix, it is necessary to employ very fine sections of the capsules, which, however, are difficult to prepare from the fresh human supra-renal body, especially if it contains much fatty matter. It is therefore advisable to harden the substance of the capsule by keeping it during a few days in a weak solution of chromic acid. After which treatment it will usually admit of being cut sufficiently thin for examination.

Considerable difference of opinion exists among histologists regarding the manner in which the cells of the cortical substance are arranged. Mr. Simon thinks that the columnar masses which they form are a series of closed tubes lying perpendicular to the surface of the organ; while Kölliker, Ecker, Frey, and most other observers describe the cells as being grouped together in a number of oblong vesicles, lying in parallel rows, but not communicating with each other. Mr. Gray, on the other hand, believes that the adjoining walls of the vesicles are sometimes removed by absorption, and thus give rise to tubular cavities.

My own opinion is, that the cells in the cortical substance of the human supra-renal bodies are grouped together in masses of various lengths, and arranged in the form of rows, which gives to them the appearance of parallel tubes. The sacculi enclosing the cell-masses vary in breadth; sometimes they are wide enough to admit of two, or even three cells lying abreast of each other within them. Occasionally, however, their diameter is only sufficient to admit of one cell. When they are wide they are usually very short, looking more like round vesicles. When narrow they are generally long; sometimes extending throughout the whole depth of the cortical substance. If their transverse diameter is sufficient to admit of one cell only, they have usually a very beautiful appearance, in consequence of the single row of cells which compose them being arranged like a single line of bricks closely set together. These columnar-shaped cell-masses are surrounded by fibro-areolar tissue, in which ramify the vessels and nerves.

As the cortical becomes blended with the medullary substance, the columnar arrangement of the cell-masses disappears, its place being taken by irregularly-sized vesicles containing from one to five cells. These vesicles, which are nothing more than short cell-masses, are unsymmetrically distributed in the medullary substance. They sometimes cease at a short distance from the edge, at other times are scattered almost throughout the whole extent of the medullary substance, from which they are easily recognised by their yellow colour.

I have here avoided using the term "tube," which was applied to the cell-masses by Simon, as I think they scarcely deserve that title. For when examined in transverse section they are seen to present a very different appearance from that of true tubes; such, for example, as we find in the kidney. In a transverse section of the latter, the cells are seen to be symmetrically arranged on a basement membrane round an opening; while in the former, the cells are more or less irregularly distributed, without having any trace of a central cavity.

In describing the cavities containing the cells, Kölliker speaks of them as mere loculi in the stroma of the organ, possessing no basement membrane. With all due deference to the opinion of my former teacher, which I have just cause to appreciate highly, I must say that I believe Ecker and Frey are correct in stating that the loculi are lined with a homogeneous membrane. I have been able to demonstrate it in the longitudinal section of the cortical substance by carefully washing away some of the cells. The membrane, although exceedingly delicate and transparent, is, however, distinctly visible at those points where it happens to be thrown into folds.

The dark slate-coloured medullary substance has a very different appearance under the microscope from that presented by the cortical part. When viewed by transmitted light it is of a paler colour, and with a high magnifying power is seen to be composed of large pale nucleated cells, tolerably regularly distributed in a fibro-granular matrix. In the medullary substance of the supra-renal capsules of some ruminant animals, Mr. Gulliver has noticed large reddish-coloured corpuscles. Kölliker and some others describe the cells in the medullary substance as very closely resembling ganglion corpuscles. To my mind they have much more the appearance of secreting cells, such as we find in the liver and kidney. In describing the structure of the medullary substance of the supra-renal capsule of the land salamander, Leydig speaks of one part of it being almost entirely composed of dirty yellow ganglion corpuscles; and that these, through a gradual change in their contents, pass directly into the fatty granular cells proper to the supra-renal body.

The structure of the medullary substance of the supra-renal capsules of different animals varies very much. In the horse, Frey says that it contains, like the cortical substance, well marked gland vesicles (cell-masses). In birds the medullary is usually not distinguishable from the cortical substance. I have seen an appearance in some human supra-renal capsules similar to that said to occur in the horse, and yet the capsules appeared otherwise healthy.

Upon histological grounds, Kölliker asserts that he would regard the function of the cortical and medullary substances as perfectly distinct from each other. The former part he looks upon as being closely allied to a secreting organ, probably in some way connected with the vascular system; while the latter, in consequence of its richness in nerves, and its containing cells resembling ganglion corpuscles, he regards as an apparatus connected with the nervous system. Leydig and Bergmann go a step farther, and say that the supra-renal capsules stand in so close a relationship with the nervous system, that they ought to be considered as part of it.

Are the Supra-renal Capsules Fœtal Organs?—The supra-renal capsules have generally been regarded as organs more particularly belonging to fœtal life. Remak says that they are developed simultaneously with, but independently of, the kidneys, and that they are originally larger than the latter organs. Most writers state that they diminish after birth, both in relative size and in activity of function, with advancing years. This is, however, only true to a certain extent; for although the supra-renal capsules do not bear the same relation to the size of the adult as they do to that of the fœtus, yet their growth, when compared with that of some of the other internal organs, is very much greater than has been usually supposed.

According to Meckel, in the human embryo at the third month, the supra-renal capsules and the kidneys are of equal size. At the sixth month, the former are to the latter as 2 to 5, and at the ninth month as 1 to 3; whereas after birth the proportion is in the child as 1 to 8, and in the adult as 1 to 28.* These figures certainly speak strongly in favour of the view that the human supra-renal bodies are organs whose function is chiefly performed during fœtal life; but they prove nothing more. On the other hand, the observations that have been made upon these organs in animals by Ecker, Frey, Brown-Séquard, and myself, tend to prove that their function is carried on with considerable activity during adult age. Frey states, that in certain mammalia the relative weight of the supra-renal capsules and kidneys is the same in the adult as in the embryo. Ecker makes a similar remark with regard to the *coluber natrix*. And Brown-Séquard says, that in dogs, cats, and guinea pigs, the weight of the capsules after birth increases in the same, if not perhaps in a greater, ratio than that of the kidneys. My own observations have been limited to one species of animal—the cat—and are far from being numerous, having only been made upon thirteen fœtal capsules and six adult capsules. But I think they are sufficiently interesting to be here quoted.

I found that five capsules from fœtal kittens, which appeared to be more than two-thirds developed, weighed 0·03 grammes; while five kidneys from the same fœtuses weighed 0·31 grammes, making the relative weight of the former to that of the latter, as 1 to $10\frac{1}{10}$th. On the other hand, the two supra-renal capsules from the mother of the kittens weighed 0·502 grammes, and the two kidneys 19·167 grammes, thus making the weight of the adult capsule to that of the kidney as 1 to 38·18. On another occasion I found that eight supra-renal capsules taken from kittens immediately after birth weighed 0·110 grammes, while the eight kidneys from the same animals weighed 6·336 grammes. Four capsules, two from the parent of the kittens, and two from another cat, weighed 0·722 grammes; while the four kidneys of the same animals weighed 39·534 grammes. The weight of the supra-renal capsule, therefore, in the kitten at birth is to that of the kidney as 1 to 57·3;[*] and in the adult, in the examples last cited, as 1 to 54·8. But as so few adult capsules and kidneys were employed, it may be perhaps better to take the average of the whole six that were examined (1 to 38·18 and 1 to 54·8) which would then give us the relative weight of these organs in the full-grown animal as 1 to 46·49.[†]

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* Handbuch der Anatomie, Band iv. p. 507.

Now if we look upon the average weight of the supra-renal capsule of the new-born cat as being 0·0137 grammes ($\frac{0·110}{8} = 0·0137$), and of the kidney as 0·792 grammes ($\frac{6·336}{8} = 0·792$); while we regard the average weight of the adult capsule as 0·204 grammes ($0·722 + 0·502 : 6 = 0·204$), and that of the kidney as 9·783 grammes ($39·534 + 19·167 : 6 = 9·783$); we shall find by a very simple calculation that the kidney has after birth increased 12·35 times in weight, while the supra-renal capsule in the same time has increased 14·87 times in weight. What conclusion are we to draw from that fact? We here see that the supra-renal capsules increase in size as age advances at a greater rate than the kidneys. I must here speak with caution, however. Small statistics are dangerous data to draw conclusions from, and perhaps a larger number of observations might furnish us with different results. I think, however, that I may say without reserve that the development of the supra-renal capsules is not arrested after birth; and, moreover, as they continue to increase in size at a certain ratio, they ought not, strictly speaking, to be regarded as fœtal organs—like the thymus gland, for example. I quite agree, therefore, with Dr. Brown when he says,

> "Des organes qui ne s'atrophient pas, et, encore plus, des organes qui croissent d'une manière notable depuis la naissance jusqu'à l'âge adulte, sont des organes qui fonctionnent; il est donc inexact de dire que les capsules surrénales appartiennent exclusivement à la vie embryonnaire."[‡]

The Chemistry of the Supra-renal Capsules.—The chemical literature of the supra-renal capsules may be summed up in a very few words; for, as far as I am aware, there are only two authors who have attempted to give us any information on this point. In the beginning of last year, Monsieur Vulpian communicated to the Société de Biologie the discovery of a very peculiar reaction possessed by the supra-renal capsules of vertebrated animals. He found that an aqueous solution of iodine brought in contact with the medullary substance gave rise to a beautiful rose colour. And further, that the greater portion of oxidizing agents acted like the iodine solution, although in a minor degree. Even the oxygen of the air, under the influence of light, produced the same effect. I have repeated Monsieur Vulpian's experiment on the medullary substance of the supra-renal capsules of sheep with success; but am equally at a loss with the author to form an opinion as to the nature of the substance which possesses the strange property alluded to. We as yet know so little regarding the nature of colour and colouring matters, that it would be futile to attempt to draw any conclusions with regard to the import of the rose-coloured reaction above spoken of.

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[*] This corresponds exactly with the result obtained by Ecker, who says the relation between the kidneys and capsules in the kitten at birth is as 1 to 56 or 1 to 60.

[†] The relative size of the supra-renal capsules and kidneys varies very considerably in different animals: in the seal, for example, it is as 1 to 150, and in the guinea-pig as 1 to 5. (Frey.)

[‡] Archives Générales de Méd., Oct. 1856.

Not being able to separate the colouring matter, Monsieur Vulpian, in concert with M. Cloez, proceeded to extract the "immediate principles" of the supra-renal bodies; and these gentlemen have recently communicated to the Institut de France as the result of their united labours, the discovery of hippuric and taurocholic acids in the supra-renal capsules of herbivorous animals.[*] But as these substances have been abundantly found in different parts of the animal body, their discovery in the latter organs, although interesting, unfortunately throws no light upon the nature of their function.[†]

Physiology of the Supra-renal Capsules.—Unfortunately, we do not as yet possess much experimental research regarding the function of the supra-renal capsules. It is only since the publication of Dr. Addison's monograph, that physiologists have attempted to unveil the impenetrable obscurity which hangs around them, by studying the effects of their removal from the bodies of healthy animals. And I believe that Gratiolet,[‡] Brown-Séquard,[§] Philipeaux,[‖] and myself,[¶] are the only observers who have as yet made the result of their observations public. It unfortunately happens, too, that the fruits of our experience have led us—or I should rather say one of us—to opposite conclusions, as will appear in the following pages, where I shall attempt to reconcile some of the discrepancies.

In endeavouring to ascertain by direct experiment the function of the capsules, I removed them from several different species of animal: the dog, the cat, the guinea-pig, the mouse, and the rat. And in order to avoid as much as possible the shock which might result from the operation (which is most undoubtedly a severe one), I invariably rendered the animals insensible, either by the smoke of the common puff-ball or by ether. By so doing, I obtained another advantage, for as the animal remained perfectly still, I was enabled to perform the operation quicker and with much less danger of wounding the neighbouring organs. It is perhaps on this account that my operations have been attended with less fatal consequences than those of another observer.

Brown-Séquard, who I imagine has performed the operation of the removal of the supra-renal capsules as often as any one else, gave the following table as the result of his experience:

Number and species of animal.	Average duration of life. Hours.	Minimum duration of life. Hours.	Maximum duration of life. Hours.
51 Rabbits	9	5½	14½
11 Dogs and cats (adult)	14	7½	17
2 Mice	8	7½	8½
11 Guinea-pigs (adult)	13	9	23
4 ,, (young)	23½	14	33
11 Young cats and dogs	37	19	49[**]

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[*] Comptes Rendus, Sept. 7th, 1857.

[†] Since the preceding remarks were in type, I have seen a communication by Virchow (Archiv f. pathol. Anat., Bd. xii. Hft. 4 u. 5) on the chemistry of the supra-renal capsules, in which he mentions that he has found Leucine in the medullary substance. He likewise confirms the observation of M. Vulpian with regard to the rose-coloured reaction.

[‡] Comptes Rendus, 1856. [§] Ib. 1856. [‖] Ib. 1856-7.

[¶] Reports of the Pathological Soc. Lond. 1857.

[**] Archives Générales de Méd., p. 395. 1856.

Here it is seen that the adult animals which he operated upon died on an average in twelve hours, while the young or new-born animals lived thirty hours; and this being the case, we can scarcely be surprised that Dr. Brown should have concluded that the supra-renal capsules were more necessary to life than even the kidneys; for animals will live two or even three days after the extirpation of the latter organs.

I am happy to state that since the publication of the above report, Brown-Séquard has continued his researches with more favourable results. He says that of ten rabbits from which he extirpated the supra-renal capsules, six died between the seventh and tenth hour, and four between the tenth and fourteenth hour after the operation. He adds that these animals died too quickly for it to be possible to attribute their death to peritonitis; further, that the extirpation of the capsules is followed by symptoms which do not occur after injuries of the peritoneum, liver, &c., the symptoms appearing to indicate that the supra-renal bodies have an important influence upon the blood, and that their nerves have a singular power upon certain points of the central nervous system. He thinks that this latter influence manifests itself very distinctly in some cases after the extirpation or the puncture of one of the capsules, the animals being occasionally observed to be seized a few minutes before death by vertigo, and rolling over. He concludes his remarks by the observation, first, "that if these organs are not essential to life, they are at least of very great importance." Secondly, "That their function appears to be at least as important as that of the kidneys, for when they are absent, death in general supervenes more rapidly than after the removal of the kidneys."*

To return to my own experiments. The first animal that I operated upon was an adult cat. She lived nine days after the operation. From this animal I removed the right capsule. The operation lasted only ninety seconds. It was accomplished remarkably easily, and without any hæmorrhage.† When the animal became sensible (she had been narcotized by the smoke of the puff-ball), she seemed to suffer little or no pain. On the day following the operation, the cat took her food well, and she continued apparently in good health up till the eighth day. It was then noticed that she had lost flesh. On the ninth day, the cat was found dead. On post-mortem examination, the pupils were observed to be fully dilated. The abdomen appeared entirely free from any signs of inflammation, with the exception of the peritoneal covering of the kidney on the operated side. It was somewhat opaque, and did not permit the superficial vessels to be seen through it as distinctly as that covering the opposite kidney. The immediate cause of death could not be ascertained.

As one of my objects in extirpating the capsules was to ascertain if their removal would be attended by any change of colour in the skin or its appendages, I took a nearly white cat, and extracted both supra-renal capsules from it at one time. Twenty-four hours after the operation, the animal was found dead, and in a state of *rigor mortis.* In consequence of its being very fat and vicious, it had been kept fasting during nearly four days before the operation was performed. On post-mortem examination, some lymph was found effused upon one of the kidneys. There was no pus, but all the other signs of peritonitis.

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* Archives Générales de Méd. p. 374. 1857.

† The attachments of this capsule were unusually slight for a right one.

On operating upon animals like the cat and dog, I usually found it necessary to ligature a vein of considerable size, which crosses directly over the middle of the capsule; and thinking that the injury done to this vessel might have caused phlebitis, I put a ligature round half of the left supra-renal capsule of a small white coach-dog, avoiding the vein altogether, and cut away the other half of the organ. The next morning, contrary to what might have been expected from the statement of Brown-Séquard, who says that mere puncture of the organ is rapidly fatal, the dog came running to meet me at the door of the room in which he was confined. He seemed to suffer little or no pain, for he frisked about, and was hungry for his food. Six days afterwards, however, he appeared much less lively, and on the ninth day after the operation, he for the first time refused to take any meat. On the tenth he looked very ill, and on the twelfth he died.

Post mortem.—On opening the abdomen, extensive and intense signs of peritonitis were observed. The intestines were glued together, and flakes of lymph abounded all over the abdominal walls. A large abscess, surrounded by an adventitious membrane, two lines in thickness, occupied the left hypochondriac region. It involved the lower half of the spleen, and rested upon the kidney. It did not, however, include the latter organ. In this case there can be no doubt as to the proximate cause of death; but a question might be raised as to whether the inflammation was excited by the injury done to the supra-renal capsule *per se*, or caused by the presence of the ligature, and damage done to the neighbouring parts during the operation.

It being a point of primary importance in the prosecution of these researches to ascertain whether the animals died from the injury inflicted upon them by the operation, or solely from the absence of the supra-renal body, and consequent arrest of its function, I proposed taking two animals of the same species, age, sex, and development—removing a capsule from one, and inflicting upon the other a similar amount of injury, with the single exception of leaving the capsule *in situ.*

My intention was somewhat sooner fulfilled than I had anticipated, for on operating upon a guinea-pig one day, I found that the capsule was traversed, and so intimately attached to a large vein, that it would be impossible to remove it without doing considerable mischief to the vessel. I therefore left the capsule where it was, and sewed up the wound. I now took the fellow of this guinea-pig, which was of the same sex, age, and development, and removed from him the capsule of the corresponding side.

Both of these animals died within twenty-four hours after the operation. Being somewhat surprised at the result of this experiment, I repeated it upon two cats that had been kept fasting during twenty-four hours before the operation. The cat from which the supra-renal capsule (the right) was removed, lived two days; the other died during the night of the third day. In the abdomens of both, signs of peritonitis were distinctly visible. To prevent mistake, I have to remark that the animal from which the capsule was *not* removed had something more done to it than the mere wound in the abdominal parietes. Had that been the only injury done, it probably would not have died. The experiment would have been incomplete; for, in removing the capsule from the other animal, the neighbouring organs, vessels, and nerves could not escape injury; and, independent of the effect arising from the mere absence of the supra-renal capsule, those other mutilations must be taken into account. In order, therefore, to make both operations as nearly as possible alike, with the exception of the removal of the capsule, I handled the kidney, the liver, and the vessels and nerves around the capsule; but so lightly, that I had no anticipation of causing the animal's death. And I must say, that even now I have no idea why it died; for many a time members of the same species of animal have been submitted to much greater mutilations with but a transient deleterious effect, as some of the experiments which shall afterwards be cited amply prove.

Finding that nothing was to be learned by the above course of procedure, except that death might follow the experiment from another cause than mere absence of the capsule, I began to consider whether or not it would be possible to remove the organ in a manner less likely to mutilate the neighbouring parts. The supra-renal bodies being very freely supplied by nerves from the solar and renal plexuses, in ligaturing the bundle of vessels it is impossible to avoid including some of the branches of the nerves in the ligature. I therefore thought of giving up using a ligature altogether, and contenting myself with simply twisting the vessels, because I was aware, from the results of experiments upon nerves in other parts of the body, that a ligature applied to them will sometimes induce a greater amount of irritation than the simple division of the same nerve by the knife.

In November, 1856, having obtained a fine, strong bull terrier dog, I resolved to remove one of his capsules without applying a ligature to the vessels. On exposing the left supra-renal body, however, I found it was traversed by a large vein, in such a manner that it could not be removed by the knife without cutting the vessel. It then occurred to me that it might be possible to enucleate the organ with my fingers, and I accordingly attempted to do so; but I found the capsule too friable. It broke to pieces, and I had to remove it portion by portion. Even then I could not get it all away; there were still some small fragments left. In this case there was little or no hæmorrhage; but, as the operation lasted some considerable time, I did not expect to find the animal alive the next day. I was agreeably disappointed, however; and although he looked ill, and refused to take food for the first few days after the operation, he gradually recovered, and in a fortnight I had the pleasure of seeing him running about.

This dog remained in my possession until last April, and never was observed to have a single day's illness, except for a few days when I had cut one of his cervical sympathetics, in order to ascertain the effect of atropine on a permanently-contracted pupil.

The next experiment worthy of notice was one performed upon a large tom-cat. On opening the abdomen of this animal, and touching the right capsule with the point of my finger, I was astonished to find it rough, and hard as a stone. As it was enucleated with the utmost facility, and without loss of blood, I at once repeated the operation on the left side, with similar success. On making a section of the capsules it was found that a considerable portion of the medullary, as well as of the cortical substance of the organs, had become replaced by a calcareous deposit, which chiefly consisted of carbonate of lime. The remaining portions of the glands contained so much fibrous tissue that their normal structure might be said to have entirely disappeared.*

This case was pregnant with interest to me. Here I had an animal from which nature might be said to have removed the supra-renal bodies; for they were in such an advanced state of disease that their function, whatever it might be, must have been entirely interrupted. I could therefore study the effects of absence of the organs without the interference of the complicated effects of the operation. The animal at the time of the operation was in excellent health, fat and strong: a most important fact, when it is remembered that Dr. Addison supposes that derangement in the function of the supra-renal capsules is accompanied by extreme emaciation and debility. As patients rarely die of supra-renal capsular disease alone, it may yet be a question whether we are right in attributing the emaciation and weakness to the disease of these organs. For here, in the above case, where the capsules were the only organs diseased, the animal's health, if I may judge from the violent display he made of his physical powers, was not in any way deteriorated.

Judging from the size of the supra-renal bodies, I should imagine that the calcareous degeneration did not attack them till after the animal had reached the adult period of life; but whether or not the colour of its hair had become changed as the disease advanced, I had no means of ascertaining. The cat, which was of a tabby colour, besides being a valuable subject on account of its enabling me to study the effects of absence of the supra-renal capsular functions without any other complication, was equally interesting in permitting me to ascertain the true amount of injury done in removing the capsules, independent of the arrest of their function—a point which it was impossible justly to appreciate in extirpating healthy organs.

As the operation on this animal had been performed with the utmost facility, and there had been no hæmorrhage, or any apparent injury done to the surrounding parts, except the tearing through the vessels and nerves, I felt sanguine of success. My astonishment was therefore great when, arriving at the College next morning, I found the cat dead. What could he have died from? It could not be from the absence of the supra-renal capsular function, for he had lived and thrived after the organs were too diseased to function. It was not from loss of blood, as there had been no hæmorrhage. It could not be from the direct shock of the operation, as it was performed while he was insensible. It was not on account of the mere wound in the abdominal parietes, for laying open the abdomen, and making even a hernia with the intestines, is not sufficient to kill a cat. What, then, could be the cause of death? Will the post-mortem appearances in the abdomen reveal it? Unfortunately they did not. Nothing, absolutely nothing, was to be seen but a very trifling attempt at peritonitis. The thorax was searched; the brain and spinal cord were examined; the bloodvessels were laid open; yet no clue to the cause of death could be detected.

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* These supra-renal capsules were shown to the Pathological Society in the month of February last.

What parts of the body had received injury during the operation besides the abdominal walls, the effects of which we may entirely dismiss from our attention? In removing the capsules their bloodvessels, lymphatics, and nerves had been torn across. We need not dwell long upon the probable effects resulting from the damage done to the two former, for both the bloodvessels and lymphatics were insignificant, in consequence of the capsules being in great part a hard mass of inorganic matter. The blood was searched for signs of phlebitis, with a negative result. It was examined for crystals, without more than the usual quantity being detected;* for the flakes of pigment described by Brown-Séquard as blocking up the central capillaries, and none were found.

The lymphatics were not specially examined. It now remains for us to glance at the probable effects arising from the tearing across of the nerves going to the supra-renal capsules; those, although small,

> "Are exceedingly numerous. They are derived from the solar plexus of the sympathetic, and from the renal plexuses. According to Bergmann, some filaments come from the phrenic and pneumogastric nerves. They are made up mainly of dark-bordered white fibres, of different sizes, and they have many small ganglia upon them."†

As neither the microscope nor chemical reagents can here much assist us, we must call experimental physiology to our aid, and see what we can discover by reasoning from analogy. The question is what would be the result of mutilating the above-named nerves, independent of the removal of the supra-renal capsules? It is an established fact, that instant death frequently follows upon sudden injury to the solar plexus. A blow on the epigastrium is often sufficient to prove rapidly fatal to life.

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* Dr. Brown-Séquard, in his memoir on the supra-renal capsules, says, that in order to obtain crystals from normal blood, it is necessary to use ammonia or some other reagent. This statement must be taken with a certain degree of reserve, for during the last half-dozen years I, like many others, have been in the habit of obtaining crystals from normal blood by simply allowing a drop to dry on a slip of glass, then adding a drop of distilled water, covering it up with a piece of thin glass, and setting it aside to crystallize. Sometimes the crystals are large, and form rapidly, at other times they are small, and occasionally altogether absent; this I imagine depends upon the state of the digestion of the animal from which the blood was drawn. They are sometimes coloured, sometimes colourless. Crystals rapidly form in the blood of starved animals, or those that have been subjected to any severe operation. They are usually more easily obtained from the blood of the spleen than that drawn from the general circulation. To those of my readers who take interest in this subject, I would strongly recommend the perusal of an able review on blood crystallization, containing much original matter, by Dr. Sieveking, in the twelfth vol. of this Journal, pp. 349-65.

† Quain's Anatomy, edited by Professors Sharpey and Ellis, vol. iii. p. 381.

Section of the great splanchnic nerves has been found by Ludwig and Haffer to kill animals in the space of one or two days. The mere pricking or cutting of the semilunar ganglion, according to Brown, proves fatal in rabbits in the course of thirty hours; while division of the sympathetic in the neighbourhood of the kidney causes death within twenty-three hours after the operation. Such being the case, need we hesitate, in the absence of all other proof as to the cause of death in the above-mentioned experiment, to regard it as probable that the animal died from the injury done, in tearing out the capsules, to the ganglionic system of nerves? I shall again have occasion to recur to this subject.

Having now given my readers a general view of the manner in which the experiments were conducted, and the results obtained, I shall refrain from citing any except those which present the subject of inquiry in a special and important light.

Is the extirpation of the right a more fatal operation than the removal of the left capsule? This question I think I may answer in the affirmative. In proof of this I cannot do better than relate the following experiments:—From two healthy cats I removed the right supra-renal capsules. The one animal died in forty, the other in forty-four hours after the operation. The only symptoms which they presented were those of gradually increasing weakness. On post-mortem examination the abdomens of both showed slight signs of peritonitis.

From two other cats, which could scarcely be regarded as so healthy as the preceding, in consequence of my having a few days previously divided one of their cervical sympathetic nerves, I extracted the left supra-renal capsules. In one of these animals an abscess formed in the vicinity of the wound, and burst externally on the fourth day after the operation; after which he gradually sank, and died on the eighth day. On opening the abdomen slight signs of peritonitis were found. The internal wound was nicely filled by omentum, the external wound was nearly completely healed. The other cat never had a bad symptom; and thirty days after the operation he looked so strong and healthy that I resolved to remove also the right capsule.

The results of these four experiments, and of several others which I need not cite, I think authorize me to have answered the question at the head of this chapter in the affirmative. Were it necessary, I might relate many others, to prove, that not only in cats, but also in all the different species of animals on which I operated, the removal of the right was, as a general rule, a more fatal operation than the removal of the left supra-renal body. Allowing this statement, then, to be a fact, the next question is, why should the extirpation of the right prove so much more fatal than that of the left capsule? M. Gratiolet, whose experiments led him to the same conclusion, thought that it depended upon the proximity of the liver, and the injury received by that organ during the operation, giving rise to hepatitis. At first I was of a somewhat similar opinion; but after seeing several cases of rapid death follow the operation, where neither hepatitis nor even marked peritonitis existed, I felt forced to look for some other cause. A close examination of the two capsules soon showed me that the difference in fatality of the operations could scarcely be said to exist in the function of the one being more important than that of the other capsule; the organs being identical in structure, and nearly of equal size. Perhaps the right may in some cases be a little larger than the left, but this difference is too inconsiderable to account for the great difference in the fatality of the two operations. On studying the anatomical relations of the supra-renal bodies, it was easy to see that the right was much more intimately connected with the surrounding parts than the left, and its removal attended with greater difficulty. The former lies higher in the abdomen than the latter; it is in contact above with the liver, in front with the vena cava, below with the upper margin of the kidney; and behind it in most cases touches the right semilunar ganglion. The left supra-renal body lies farther from the mesial line; it is in contact below with the upper margin of the kidney, in front (usually) crossed by a branch of the vena cava, behind with the parietes of the abdomen, and above with the spleen, but not adherent to it.

The right semilunar ganglion, which is much larger than the left, lies (in the dog and cat) directly beneath the supra-renal capsule; while the smaller left semilunar ganglion is placed on the left crus of the diaphragm, and internal to the supra-renal body. A glance at these anatomical relations shows that much greater injury is likely to be done to the sympathetic system of nerves in the extirpation of the right than of the left supra-renal capsule. And from what has already been said with regard to the immediate cause of death, probably arising from the mischief done to the ganglions, it is easy to understand why the removal of the right should, as a general rule, prove more rapidly fatal than that of the left supra-renal body.

In the case of double organs, it is usually found that after the removal of one, the other becomes after a time somewhat enlarged, from having taken on the functions of its fellow in addition to its own. I was anxious to see if the same result had occurred in the case of the cat which made such a good recovery after the removal of the left supra-renal capsule. I accordingly removed the right capsule. On careful examination, it was found neither inflamed nor hypertrophied; but it must be remembered that only a month had elapsed since the removal of the other capsule. After this latter operation, the animal cried for some hours, as if suffering extreme pain. The next day it appeared very much depressed, and on the morning of the third day it was found dead, with the pupils dilated, and in a state of well-marked *rigor mortis*.

On examining the abdomen, signs of peritonitis were seen in the neighbourhood of the right kidney, the capsule of which was thickened and opaque. In the wound behind the kidney was a considerable quantity of pus. The great abdominal and thoracic veins were engorged with partly-coagulated blood. The right side of the heart was full of purple-coloured blood, on some of which being poured over the surface of a white vessel, it presented that granular look usually seen in blood beginning to putrify. It did not oxygenate readily on exposure to the air. When examined with the microscope, a great number of lymph globules were found in it. No crystals could be obtained from either the liquid or coagulated blood. No signs of inflammation were detected in the large veins. Two of the lumbar lymphatic glands were very much enlarged, especially the one on the right side of the abdomen. It presented a peculiarly beautiful, semi-transparent, lobular appearance, such as I had never before witnessed.

The gland was placed in a little water preliminary to preserving it; but next day it was found to have lost its strange lobular appearance, and looked like an ordinary lymphatic gland. The hypertrophied gland on the left side of the abdomen, on being examined with the microscope, was found full of well-formed circular lymph cells.

I tried to remove the supra-renal capsules from white mice, but I found them too delicate to stand the operation. With rats, on the other hand, I was more fortunate. The rat, indeed, is admirably well suited for this experiment, in consequence of the attachments of its supra-renal bodies being extremely slight. The organ on the left side hangs almost loosely in the abdomen; its vessels and nerves are nearly its only bands of union. On the right side, again, it is somewhat more intimately connected with the neighbouring parts, but not sufficiently to give rise to any great difficulty in its removal. The supra-renal capsule of the rat is about the size of a pea, and of a circular form, in consequence of its very slight attachments.*

The following is the result of one of my first experiments upon a white rat. The animal having been rendered insensible, I made an incision on the right side of the abdomen, close under the floating ribs, and removed the supra-renal capsule. Next day, the respirations were 139 in the minute. The animal, however, rapidly recovered, and nine days afterwards it appeared so well, that I removed the left capsule also. The latter came very readily away,—neither knives nor ligatures were required. A single twist with the forceps at once removed it, and without hæmorrhage.

The colour of the hair and of the skin was carefully watched without any peculiarity being observed until about ten days after the last operation, when the neck of the animal was noticed to have become denuded of hair: the skin, however, retained its white colour. The animal began from this time to refuse food, and seemed gradually to get weaker and weaker, until it died, twenty-five days after the extirpation of the right, and sixteen days after the removal of the left supra-renal capsule. The exterior of the body was carefully examined, but no discoloration of the skin could be detected. The portion of the skin that had been denuded of hair was now seen to be covered with a luxuriant crop of young hair, about one-eighth of an inch long, showing that the affection of the cutaneous appendages had not been permanent, but merely transient. It is not at all uncommon for animals to lose part of their hair after severe operations. I have seen this very frequently occur in rabbits and cats.

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* *Vide* the researches of Professor Ludwig Fick on the cause of the form of bones. Göttingen, 1857.

On opening the abdomen of this rat, the intestines looked like a gelatinous mass: at the first glance it was impossible to recognise what they were, and it was only on close examination that they were found to be the intestines. Their walls were so thin and transparent that the air-bubbles could be distinctly seen floating in their interior.* The left half of the stomach was healthy, but the right half was in a similar condition to the intestines. It contained a clear amber-coloured mucus with a faintly alkaline reaction. This proved that the softening was not produced by the post-mortem action of the gastric juice. A similar condition of the stomach and intestines has been often observed in ill-fed, half-starved children, and more especially in those cases where they die of a depressed condition of the ganglionic nervous system. I believe that the degeneration of the stomach and intestines of this animal may have had for its cause the injury done to the ganglionic system of nerves, especially those branches supplied to the capsules by the solar plexus. The left capsule, as was said, had been extracted with the greatest facility, and on that side the wound in the peritoneum could only be detected on the closest inspection. By the mere examination of the internal parts no one could have imagined that such an operation had been so lately performed.

The removal of the right capsule had been attended with some difficulty, in consequence of its closer adherence to the inferior vena cava and neighbouring parts. On this side the margin of the liver was found attached to the wound by somewhat strong adhesions. The right side of the stomach only being in a state of gelatiniform degeneration might be owing to the greater injury done to the nerves on that side, for the anatomical reasons before mentioned.

Other experiments on the rat proved more successful. I shall quote the following, as it has a peculiar interest on more than one account.

In March last I removed the right supra-renal capsule from a piebald rat. The operation was a very disagreeable one, in consequence of the animal not having been rendered sufficiently insensible. As it lasted several minutes I had little hope of the animal's surviving. Contrary to my anticipations, however, he made a tolerably rapid recovery, and in the beginning of May, as he was in excellent condition, I removed the other capsule. As six weeks had elapsed since the extirpation of the right supra-renal capsule, I carefully examined the left, and compared it with other capsules taken from animals of the same species and age, in order to ascertain if it had become hypertrophied. But in this, as in the case of the cat, I could not find any very marked difference in either its size or appearance. From the effects of the latter operation the animal speedily recovered, and he ultimately (in the course of a month or two) became very fat and healthy-looking.

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* The intestines of mice and rats are usually somewhat transparent, but nothing in comparison to what was here observed.

I think, after reading the report of this case, one will scarcely be inclined to assert that the supra-renal capsules are absolutely essential to life, or that the absence of their function is attended with emaciation and debility. I know that some will say that the function of the supra-renal capsules had been in this case vicariously performed by another organ. To these gentlemen I have only to reply that I do not deny this; but that their argument is equally applicable to the human subject, and if they apply it in the one, they ought to apply it in the other case also.

With regard to the connexion of the supra-renal capsular function and bronzing of the skin, I shall at present merely remark, that in the case of this rat no increase of pigment was observed to take place. One day I was told by a gentleman who occasionally came to see my animals without supra-renal capsules, that the fact of no deposit of pigment occurring in the skin, or its appendages, of white rats after the removal of their capsules, was no argument against the idea that the function of the supra-renal bodies was so to modify the animal colouring matter as to prevent its becoming deposited in the skin. For, said he, the peculiar constitution of the albino is exactly such as to prevent any deposition of pigment taking place. I would bring forward several arguments against this view, were it not that they are rendered entirely unnecessary by the result obtained in this case. The objection raised by the gentleman against the albinoes does not hold good with regard to the piebald animal. Being half brown, it could not have possessed any peculiar idiosyncrasy preventing a deposit of pigment. Yet, notwithstanding that it was without the organs supposed to be essential to the transformation of pigment during a quarter of a year,* no increased deposit either in the skin or its appendages could, after the most searching scrutiny, be detected. What are we to conclude from this fact? Is the theory of bronzed skin untenable in the case of certain animals?

Rats not only survive after extirpation of the supra-renal capsules, but even become strong and healthy after the removal of the spleen also. I have at present in my possession some animals from which the spleen and supra-renal capsules were removed when they were a month old. Yet, notwithstanding this, they have grown up without any apparent modification of their functions having taken place, and are now fine specimens of the well-developed adult animal.

Monsieur Philipeaux has even been more successful: he has removed the spleen, the supra-renal capsules, and the thyroid glands from the same animal, and it has afterwards recovered. I removed the thyroids from a rat nine weeks after the removal of its spleen and supra-renal capsules, but the animal died two days after the operation.

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* One hundred and twenty days after the removal of the right, and eighty days after the extirpation of the left supra-renal capsule, I took away the spleen from this animal. The blood of the spleen immediataly after the operation was examined by the gentlemen attending my practical class, and found to contain an immense number of white corpuscles. Only one of the gentlemen, Mr. Mauley, obtained it crystallized. His specimen was full of beautiful rhombic prisms and needle-shaped crystals. The animal died a fortnight after the latter operation. On opening the abdomen, the stomach and part of the intestines were found adherent to the recent wound, while the liver and another part of the intestines were attached to the parts surrounding the old wound on the right side. No supra-renal capsules were found.

Its blood crystallized with the utmost facility. The crystals were almost all colourless. In the urine of this animal I found a great number of large bundles of needle-shaped crystals. They appeared to be either hippuric, or a peculiar form of uric acid, but unfortunately I had not a sufficient quantity to ascertain their reactions.

While in Paris last summer, Monsieur Philipeaux—whose experiments have led him to the same conclusions as myself—and I repeated our experiments together on a number of young rats, some of which I brought to England with me; and although it is now more than a quarter of a year since their spleens and supra-renal capsules were extirpated, the animals are still alive and well. I intend to breed from them, in order to see if, after the third or fourth generation of animals without spleen and supra-renal capsules, any change in the cutaneous or other functions will be observable. One of the rats that I brought home with me was the offspring of a mother without either the supra-renal capsules or spleen. From it Monsieur Philipeaux extracted those organs when it was aged twenty-six days; it is now four months old, and although scarcely so large as the generality of animals of the same species at that age, is yet quite healthy and strong.

From the results of the foregoing experiments, I think we may draw the following conclusions:—

1st. The supra-renal capsules are not solely fœtal organs.

2nd. The supra-renal capsules are not absolutely essential to life.

3rd. The removal of the right is generally more fatal than removal of the left capsule.

4th. That convulsions do not necessarily follow the removal of the capsules.*

5th. That the absence of their function (in rats) is attended neither by great emaciation nor debility.

6th. That when death follows upon the extirpation of the supra-renal bodies, it is in most cases in consequence of the injury done to the neighbouring tissues; perhaps, most frequently the mutilation of the ganglionic system of nerves.

7th. Absence of the function of the supra-renal bodies is not proved to have any special effect in arresting the transformation of hæmatin, or in increasing the formation of blood crystals.

8th. The suppression of the supra-renal capsular function is not attended by an increased deposit of pigment in the skin or its appendages (in rats).

9th. The problem of the connexion of bronzed skin and supra-renal capsular disease is more likely to be solved in the dead-house than in the physiological laboratory.

(*To be continued.*)

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* In a letter dated Nov. 15th, Professor Virchow informs me that he also has extirpated the supra-renal capsules, without having noticed the derangement of the central nervous system mentioned by Brown-Séquard. I should add, that I have seen two animals suffer from convulsions after extirpation of the capsules. One, a cat, died soon after, having slight tetanic symptoms.

ART. III.

On Simple Sanguineous Cyst of the Ear in Lunatics. By W. PHILLIMORE STIFF, M.B., Resident Physician to the County Asylum, Nottingham.

AT intervals there have appeared scattered through the medical periodicals, chiefly of Germany, notices of a remarkable and well-defined disease of the external ear, almost unknown in general practice, but familiar to psychopathic physicians, some of whom consider it peculiar to the insane. I shall describe it under the name of simple sanguineous cyst of the auricle, or hæmatoma auris. In asylums it is known by the name of the "shrivelled ear."

Dr. Frederic Bird, of the asylum at Siegburg, was the first to define its connexion with insanity. Amongst the more recent writers on these sanguineous tumours must be especially noticed Dr. Fischer, of Illnau, whose valuable essay has been ably translated by Dr. Arlidge, in the 'Asylum Journal' for February, 1854.

Mr. Wilde, referring to this disease in his work 'On Special Diseases of the Ear,' says:

> "Having no experience of this affection myself, I wrote to a number of medical friends connected with lunatic asylums, and although their statements varied, both as to its existence and cause, the establishment of the disease as affecting a particular class of the community has been fully established. Dr. Thurnam, who has great experience on the subject of lunacy, is of opinion that the disease has been frequently produced by injury, and that it was much more common when restraint was more extensively used than at present."

Mr. Wilde makes these observations under the head of 'Inflammation of the Auricle,' classifying the disease with erysipelas and other inflammations, whilst, in a previous chapter, he gives a representation of the same disease under 'Tumours of the Auricle,' observing that it is a rare form of disease in man, but that he has frequently seen it in dogs.

My attention was directed towards the subject by an observation of Feuchtersleben, who, in treating of the complications of insanity, adds:

> "We must here mention, further, a peculiar sanguineous tumour in the ear, improperly called *erysipelas auris*, hitherto observed only in those who labour under chronic mania, respecting the connexion of which with that disease nothing whatever has yet been ascertained."*

The following cases, referred to in detail, are now under my care at the Nottingham Asylum, and illustrate the several stages of the disease:

CASE I.—S. H., aged thirty-four. Admitted in August, 1856, in a state of acute dementia. Alleged cause of insanity, a weight falling on his head two years ago. Not epileptic. Conduct generally tranquil. Notions confused; answers yes and no indiscriminately. Eleven months after admission, no improvement in his mental state; bodily health good; appetite voracious. Of late the integument of the right ear has been congested; the concha inelastic and thickened. He stands in the sun a great deal; has not been violent, nor subjected to physical injury.

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* Medical Psychology, p. 300 (Sydenham Society).

June 30, 1857.—This morning the pinna is of a dusky colour, and distended by a swelling containing fluid. It is tense, elastic, and creates the impression of the cartilage being split into two layers. The antihelix, scaphoid and innominate fossæ are obliterated; meatus partially obstructed; skin unbroken. Lobule not affected. Six days after the effusion was noticed, a photograph was taken. (See Fig. 1.)

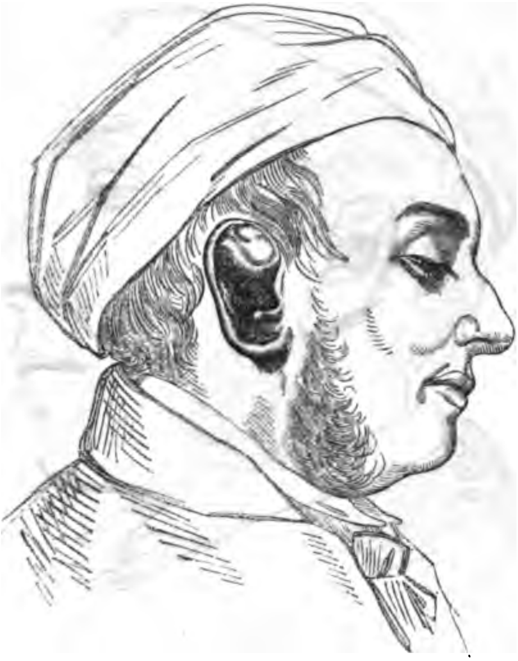

Fig. 1.—Stage of Effusion.

It is now (November) in course of resorption, and tending towards spontaneous cure. The ear has diminished in size from 66 millimètres extreme length, and 42 millimètres transverse admeasurement, to 64 millimètres and 38 millimètres respectively. The left ear is of natural size, but for several weeks past has shown signs of congestion and cartilaginous thickening. This patient has symptoms of general paralysis of the insane.

CASE II.—R. G., aged thirty-five. May, 1855. Has been in the asylum twelve months. Confirmed mania. Alleged cause, pecuniary losses. Not epileptic, nor subjected to physical injury. Conduct inert, occasionally noisy. Has hallucinations; imagines himself a wall, and wants to be built up; is the subject of fantastic automatism. Digestion disordered; appetite excessive. Has had a swelling of the right auricle for several months. State of health when it appeared, not remarkable. The tumour is larger than that represented in Fig. 2, which was taken twelve months subsequently. It extends from the upper edge of the helix to the meatus. Skin tense and inelastic. Ear distorted; thicker, shorter, and narrower than the sound one; anterior and posterior walls unusually convex. Tragus and lobule not implicated. The bulging of the ear evidently produced by fluid. The hæmatoma is in the cystic stage, or stage of resorption. It was opened, and discharged uncoagulated blood of a florid hue; hæmorrhage troublesome; the incision healed by first intention, but the cyst rapidly filled again. During the last two years absorption and atrophy have been slowly progressing, leaving the disorganized portion of the ear

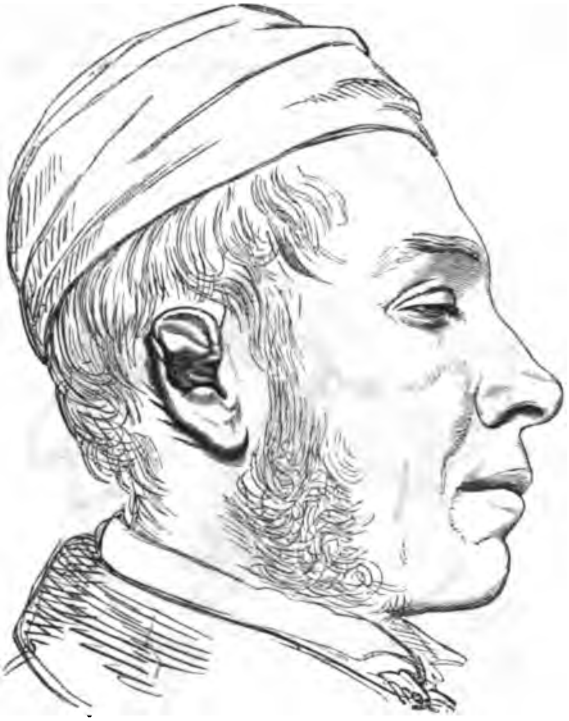

FIG. 2.—CYSTIC STAGE.

shrivelled, thickened, and indurated. Length of the sound ear, 60 millimètres, width, 35 millimètres. Of the diseased, 58 millimètres, and 28 millimètres, respectively.

Case III.—P. L., aged fifty. April, 1855. Admitted in a state of mania, said to be of six weeks' duration; in weak bodily health, suffering from acute dyspepsia. Not epileptic. Alleged cause, domestic trouble, with hereditary predisposition. Conduct tranquil; delusion, that he is sold to the devil. A month afterwards he refused his food obstinately for several days; breath became fœtid, tongue red at the tip and sides, coated with a brown fur along the centre; bones prominent; œdema of the ankles; and extreme exhaustion. At one time he appeared to be sinking; he was forcibly fed by means of Eguisier's irrigateur twice daily for three weeks; alteratives, salines, and tonics were administered, and on the 22nd June he took his food well; in a few months he became stout, but without improvement in his state of mind.

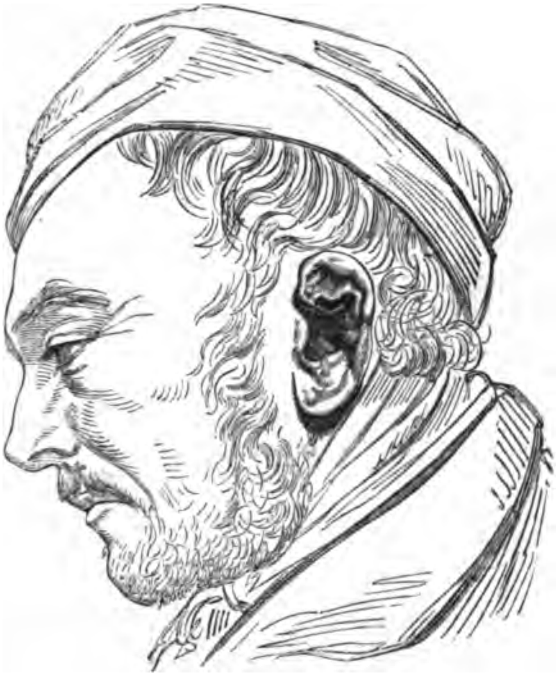

Fig. 3.—Stage of Permanent Induration.

December 22nd.—Is in robust health; the anterior surface of the left ear has unexpectedly presented symptoms of sanguineous effusion;

the integument is of a bluish red colour, congested, without abrasion; the swelling, which was not observed the day before, occupies the helix, antihelix, and fossa innominata; the lobule sound; has not been in the habit of rubbing his ears, nor experienced injury.

January 12th, 1856.—Resorption has commenced; the swelling paler and reduced.

18th.—The cyst is now confined to the antihelix and neighbourhood, is inelastic and hard. During the last year and a half it has been gradually progressing towards spontaneous cure, as seen in Fig. 3. Length of the sound ear, 71 millimètres; width, 39 millimètres: length of the diseased, 65 millimètres; width, 32 millimètres.

Case IV.—J. W., aged thirty-four. Admitted November, 1856, in a state of acute mania. Assigned cause, physical injury and hereditary predisposition. General health bad; exhaustion. Conduct violent; notions incoherent; countenance painfully distorted; the left eye wild and prominent, the right eyelid paralysed, with dilatation of the pupil. Not epileptic. He was treated with calomel and opium, and improved rapidly, both in health and mental state.

January 10th, 1857.—A small hæmatoma has appeared on the antihelix, which is of a dusky red; it disappeared without treatment in six weeks, leaving a portion of the antihelix hard, white, and the ear undiminished in size. The mental symptoms have improved, but the prognosis is yet doubtful. No pain was complained of in this and the preceding cases.

I have examined the ears of 249 other patients in the asylum—viz., 124 men, 125 women, and find the cartilages more or less thickened and indurated in 17, probably the results of old hæmatomata. See Table.

Males.			Females.		
Right ear.	Left ear.	Both.	Right ear.	Left ear.	Both.
3	2	7	1	4	0

The disease predominates in men. By adding the four preceding cases to those enumerated in the Table, it will be found that it extends to about one-twelfth of the average number resident.

The progress of the disease may be divided into four stages:

1. The stage of hyperæmia, and probably chronic arteritis, as shown by the congestion and loss of elasticity of the cartilage. This stage may exist without the development of the hæmatoma.

2. The stage of effusion; an apoplectic foyer is suddenly formed, causing obliteration of the ridges and depressions of the ear.

3. The cystic stage; in a comparatively short time absorption commences, the ridges reappear, but altered in shape. This stage may last for years.

4. Permanent induration, complete absorption of the fluid, and occasionally atrophy of the ear.

There are some points in the anatomy of the external ear which throw light upon the nature of the disease:—

1. In all these cases the disease was situated on the anterior surface of the pinna, and this is in consonance with the well-known vascularity of the part. On this surface the branches of the anterior and posterior auricular arteries ramify and anastomose. It is worthy of note that the posterior auricular artery gives off the stylomastoid, which runs a remarkable course, and terminates by anastomosing with the middle meningeal in the cavity of the cranium.

2. The paucity of lymphatic vessels on this surface, as compared with the posterior, explains the chronic character of the cystic stage.

3. The lobule is never affected.

A review of these cases leads me to some conclusions at variance with those of other observers. Fischer affirms that "the disease is to be looked for less in any one special form of insanity than in a deep-seated malady of the nervous system, attended with dyscrasia." I do not question the existence of the serious cerebral lesion, but if by dyscrasia is meant a blood disease, the cases narrated presented no symptoms of a general or specific character at the development,—on the contrary, the hæmatoma appeared when the bodily health was improving, and as the functions of digestion and circulation became more active. The mental disorder in three of the cases has become chronic, and in the fourth only is there any decided improvement.

It has been urged that these hæmatomata are connected with a scorbutic state of blood. The history of the case would alone be sufficient to nullify this hypothesis. If other reasons are wanted, it may be added that hæmatic cysts of the ear are not enumerated among the symptoms of scorbutus, and that the disease is to be found most frequently in lunatic asylums, where ample provision of fresh vegetables is made in the dietary, and the strictest attention paid to hygienic precautions.

No physical injury could be traced in any of the cases, nor were any mechanical restraints imposed; neither did the disease supervene during paroxysms of violence. Epileptics, who are the subjects of the most deplorable injuries and bruises about the head, although not altogether exempt, furnish but two examples in the table.

The symptoms and duration of contusions are so widely different to those described, that there seems to be little foundation for supposing that the disease is brought about by physical injuries or the use of mechanical restraint.

I conclude from the foregoing observations, that simple sanguineous cyst of the ear is the result of a true hæmorrhage, consequent upon impaired texture of the coats and laceration of the small bloodvessels of the perichondrium, and produced by causes analogous to those that excite cerebral apoplexy. The duration of the disease appears to depend upon the extent of the cartilage affected and the size of the cyst. It tends towards spontaneous cure. The sense of hearing is not necessarily affected. Local applications are superfluous. It must, however, be conceded that the presence of the hæmatoma adds to the gravity of the prognosis of the mental disorder.

PART FOURTH.

Chronicle of Medical Science.

HALF-YEARLY REPORT ON PHYSIOLOGY.

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I. General Physiology.

1. **Ludwig**: *On the Diffusion between Parts of the same Solution, unequally Heated in different Places.* (Sitzungsber. d. k. k. Akademie zu Wien, Band xx.; and Canstatt's Jahresbericht über d. Physiolog. Wissenschaften in 1856, p. 3.)
2. **Wittich**: *On the Diffusion of Albumen.* (Müller's Archiv, 1856, Heft 3; and Canstatt, l. c., p. 4.)
3. **Bernard**: *Experimental Researches on Animal Temperature.* (Compt. Rend., vol. xliii., p. 329 and 361; and Canstatt, l. c., p. 8.)
4. **Hoppe, F.**: *On the Influence of Loss of Warmth on the Temperature of Warm-blooded Animals.* (Virchow's Archiv f. Path. Anat., &c., Band. xi., p. 453.)

Ludwig communicates an experiment of great interest regarding the doctrine of diffusion. He filled a horizontal tube, the ends of which were bent downwards, with a homogeneous solution of salt. One of the two ends was kept at the temperature of boiling water, the other at that of melting ice. After a few days the proportion of salt in the different parts of the tube was unequal, the refrigerated portion containing much more of it than that which had been kept warm. The warmth had, so to say, expelled the salt from the solution.

Wittich, in his experiments on the endosmotic phenomena of albumen obtained from the hen's egg, found that this substance does not pass over into pure water, but that it passes over into solutions of culinary salt, and that it does this up to a certain degree of concentration in an increasing proportion corresponding to the increased concentration of the solution. If, however, the concentration surpasses a certain degree, then the albumen passes over in diminished quantity, and altogether ceases doing so when the solution of salt is saturated.

We have communicated, at page 251 of No. XXXVII. of this Journal, the results of the first series of Bernard's experiments on animal heat. In a second series this author endeavours to elucidate the influence which the passage of the blood through the lungs exercises on its temperature, by introducing thermometers through the carotis into the left, and through the vena jugularis into the right, ventricle. He found the blood in the right ventricle always warmer than that in the left, as well in dogs as in sheep; the difference being about 0·36° Fahr. This result confirms, therefore, an observation previously made by G. von Liebig.

Hoppe draws, from his thermometric observations on dogs exposed to the influence of vapour and water baths of different temperature, the following inferences:—1. By complete suspension of the loss of heat, and by addition of heat from without, the temperature of the blood becomes increased, and this the more rapidly the greater the loss in a certain time. 2. By suddenly increased loss of warmth the temperature of the blood is rendered lower, in proportion to the intensity and the duration of the loss. 3. The sudden increase of the temperature of the blood through the addition of heat, is followed, after the suspension of the latter, by decrease of the warmth of the blood below its average. 4. A sudden increase of the loss of heat is followed by an elevation of the temperature of the blood to its maximum. 5. A continuous considerable loss of heat retains the temperature of the blood at its maximum; continued small loss of heat causes sinking of the temperature of the blood.

II. FOOD AND DIGESTION.

1. **BÖCKEL**: *On Ozone.* (Thèse présentée à la Fac. de Strassbourg, 1856; and Canstatt, l. c., p. 154.)
2. **SCOUTETTEN**: *On the Formation and Sources of the Atmospheric Ozone.* (Gaz. Hebdom. de Méd. et de Chir., Nos. 29 and 32, 1856; and Canstatt, l. c., p. 155.)
3. **CLOEZ**: *Observations on the Employment of Iodide of Potassium as a Reagent on Ozone.* (Compt. Rend., 7 Juill. 1856; and Canstatt, l. c., p. 155.)
4. **MOSLER**: *On the Influence of the Internal Use of Water in various Quantities on the Metamorphosis of Matter.* (Archiv d. Vereins f. gemeinsch. Arbeiten, Band iii., p. 398, 1857.) Successful Prize Essay.
5. **WICKE**: *On the Per-centage of Water and Fat in the Milk of Goats at different periods of the Day.* (Annal. d. Chemie, Band xcviii.; and Archiv f. gemeinsch. Arb., Band iii., p. 496, 1857.)
6. **HEYNSIUS**: *Contribution to the Knowledge of the Secretion of Milk.* (Nederl. Lancet; and Schmidt's Jahrb., Band xcv., p. 145.)
7. **CRUSIUS**: *On some Alterations of the Milk of Cows during the first days after Calving.* (Erdm. Journ., Band lxviii., p. 1; and Canstatt, l. c., p. 174.)
8. **SCHEVEN**: *On the Composition of the Milk of Swine.* (Erdm. Journ., Band lxviii., p. 224; and Canstatt, l. c., p. 175.)
9. **SCHIFF**: *On the Action of the Pancreatic Juice and the Bile in the Absorption of Fat.* (Moleschott's Untersuchungen zu Naturlehre, Band ii., p. 345, 1857.)
10. **LONGET**: *On Saliva.* (Conf. under Secretions.)

Böckel presented a very interesting essay On Ozone to the Medical Faculty at Strasbourg. He describes the history of ozone, its formation from normal oxygen under the influence of electricity, light, heat, and chemical agents; he enters on the defects in the means of measuring the ozone; he communicates his observations regarding the influence of the atmospheric pressure, temperature, atmospheric moisture, thunder, direction of wind, &c.; the local differences especially with regard to country and town, and the relation of ozone to the purity of the air. In the last part the author discusses the action of ozone on the organism; he reports some experiments on animals, tables of patients admitted into the Civil Hospital at Strasbourg between 1853 and 1855, and the average amount of ozone noted during the corresponding periods; another table on the mortality, and observations concerning the cholera epidemic, &c. The inferences Böckel arrives at are—1. That the influence of ozone on the production and increase of pulmonary complaints appears to be beyond doubt. 2. That the relation between the amount of ozone in the air and the existence of gastric and rheumatic complaints, is not yet sufficiently elucidated. 3. That ague, typhus, and typhoid, and other exanthematic fevers, do not bear any relation to ozone. 4. That although cholera makes in general its appearance at the period of the maximum of temperature and of the minimum of ozone, yet the latter does not seem to exercise any influence on the progress of the epidemic.

Scoutetten endeavours to show that ozone is produced from ordinary oxygen, also during the evaporation of water, and during the process of vegetation of plants. The influence of the direct light of the sun is in both cases indispensable. The circumstance that the oxygen emanating from distilled water is not in the state of ozone, appears to prove that chemical interchanges between the water and the substances contained in it are of importance. Cloëz remarks that the iodide of potassium starch paper is a very uncertain reagent, as acid vapours and etheric oils emanating from vegetables affect it in the same manner as ozonized oxygen. The presence of trees and plants in general is, according to this author, of great influence on the reaction in question; plants rich in aromatic and ethereal substances possess this influence in a striking degree, while those without smell are almost indifferent.

Mosler contributes a valuable essay, On the Influence of Water on the Metamorphosis of Matter, which has gained the first prize from the *Verein für Gemeinschaftliche Arbeiten*. The author divides his researches into those made on children, those on adult females, and those on adult males: in all of them he examined the phenomena of metamorphosis—*a*, when the ingesta and the manner of living were as usual; *b*, when the water taken with the fluid articles of food was withdrawn; *c*, when various quantities of water were added to the amount of food. The water employed was pure, containing in sixteen ounces only 2·774 grains of solid substances, and 1·1036 grain carbonic acid. Abstinence from taking water led to the diminution of the secretions and excretions, principally those from the kidneys. Although the specific gravity of the urine became much increased, yet not only the quantity of water but also the total amount of solids excreted within a certain period was considerably lessened, and most so that of the urea, after which ranks the chloride of sodium, the phosphoric and sulphuric acids. Lesser was the decrease in the excretion through the skin and lungs. The stools were more bound, the tongue rather dry, the appetite defective. Increased ingestion of water caused an acceleration of the total metamorphosis of matter, which in some instances manifested itself more through the skin than through the other organs of excretion; in most cases, however, principally through increased flow of urine containing an increased amount of solid constituents: the increase was largest as regards urea, after which follow chloride of sodium, phosphoric acid and sulphuric acid. These phenomena were accompanied by loss of weight of the body. On the days succeeding the increased ingestion of water the excretions were diminished, and the body gained weight.

Wicke's examinations of the milk of goats during a series of days, show that on the average the per-centage of fat is smallest in the morning milk (4·607 per cent.), largest in that of the evening (5·224 per cent.), intermediate in that drawn at noon (4·946 per cent.); there are, however, frequent exceptions to this rule. The sugar and the salts offered only slight variations. The average proportion of water in the milk from the morning is 84·892 per cent., in that from noon 84·964 per cent., in that from the evening 84·436 per cent. The albuminous constituents were not determined.

Heynsius corroborates the statement made by Parmentier and Deyeux, Peligot and Reiset, that the milk drawn first from the udder contains less fat than the second portion. The analysis of the milk obtained from five cows yields the following figures :—

Morning Milk.

	First Portion.		Second Portion.	
	Soluble in Ether.	Insoluble in Ether.	Soluble in Ether.	Insoluble in Ether.
Maximum	2·39	8·84	4·89	8·92
Minimum	0·90	8·67	3·24	8·12

Evening Milk.

	Soluble in Ether.	Insoluble in Ether.	Soluble in Ether.	Insoluble in Ether.
Maximum	2·29	8·89	4·80	8·82
Minimum	0·83	8·56	3·24	8·20

The result of the analysis of the milk of nine women, before and after putting the child to the breast, is seen in the following table:—

	Before putting the Child to the Breast.		After putting the Child to the Breast.	
	Soluble in Ether.	Insoluble in Ether.	Soluble in Ether.	Insoluble in Ether.
Maximum	4·05	9·90	4·84	10·41
Medium .	2·37	8·20	2·85	8·82
Minimum	1·88	7·54	1·27	7.52

These tables show at the same time that the second portion of the cow's milk contains a rather smaller quantity of substances insoluble in ether; from a more detailed analysis, we perceive that the milk-sugar exhibits no decided variation, while the average of casein in the first portion is 3·15, and in the second portion only 2·82.

The milk of women manifests greater equality regarding the proportion of fat, and the figures for casein and sugar of milk do not allow the inference that their per-centage is, as a rule, diminished in the second portion of the milk. The author's further researches show that there exist always in the milk of cows, besides the casein, two kinds of albumen. These remain dissolved in the serum lactis, after the coagulation of the milk by means of rennet and slight heat. The quantity of both kinds varies from 0·54 to 0·34 per cent.; the two portions of milk do not exhibit any marked difference regarding these two albuminates. Heynsius is of opinion that these albuminous substances are derived from a part of the casein which is retained in solution by the lactic acid. With respect to the inorganic constituents, the two portions of the milk did not differ considerably.

Crusius, in his examinations of cow's milk, repeatedly observed that no reduction of oxide of copper took place through the milk secreted during the first days after calving; a phenomenon, however, which never lasted beyond the sixth day. He further was struck by the large amount of an albuminous substance precipitable neither by rennet nor by acetic acid at 40° Cent. In the colostrum first drawn the quantity was in general so large that it became entirely coagulated by the process of boiling. Hydrochloric acid and alcohol produced its precipitation. For further reactions we must refer to the essay itself. As the most important results of the author's examinations, we may mention:— 1. That the per-centage of solids was largest immediately after calving (14·2 to 38·4 per cent.), decreased in general steadily up to between the fourth and seventh day, from whence it remained almost stationary (11·6 to 12·6 per cent.). 2. The same was the case with the per-centage of butter, 8·4 to 2·5 per cent. at first, 3·5 to 1·7 per cent. later. 3. The amount of sugar of milk was, soon after calving, very small (2·9 to 0·0 per cent.), but it reached its average proportion already on the third or fourth day, and then remained constant (3·6 to 4·5 per cent.). 4. The quantity of albuminous substances appears to be in the colostrum almost the double of what it is in the ordinary milk. 5. The albuminous body remaining in solution after the precipitation of the casein, forms a large proportion of the proteinaceous substances.

Scheven examined the milk of two swine after five weeks' suckling, the food of which consisted of vegetable substances and milk. He found the following composition for 1000 parts:—

	A.	B.
Water	854·9	881·7
Solids	145·1	118·3
Butter	19·3	10·3
Sugar	30·4	22·6
Casein	84·5	73·6
Soluble salts	2·6	2·6
Insoluble salts	8·3	9·2

The salts consisted of:—

	A, in 100 parts.	B, in 1000 parts of milk.
Chloride of sodium	12·69	1·497
Chloride of calcium	3·40	0·401
Sulphate of potash	2·78	0·328
Potash	2·57	0·303
Phosphate of oxide of iron	1·64	0·193
Phosphate of lime	73·56	8·680
Phosphate of magnesia	3·87	0·456
		11·856

The richness in casein distinguishes, therefore, the milk of swine when compared with that of herbivores.

Schiff contests, upon pathological grounds, Bernard's view, that the *pancreatic juice* is the only and indispensable agent for the absorption of fat. He adduces some cases in which a considerable amount of fat was discovered in the body of such who had suffered for a long time from disease of the pancreas. He further shows that there are cases on record in which the excretion of large quantities of fat-like matter with the fæces had taken place without disease of the pancreas.

Regarding the action of *bile* in the absorption of fat, Schiff contends that the bile does not produce any chemical alteration in the fats, and facilitate, through this, the absorption; but that it acts as a stimulant on the contractile elements of the villi, that it causes them to contract and to empty their contents into the lymphatic vessels; that thus room is prepared for the entrance of a fresh quantity of fat into the emptied villi. The author shows by experiment that bile is a stimulus for the muscular fibre, and especially the organic muscular fibre.

III. Blood; Lymph; Respiration.

1. Nasse: *Hematological Communications.* (Archiv f. Gem. Arbeit., Band iii., p. 471, 1857.)
2. Parchappe: *On the Quantitative Analysis of the Constituent Principles of the Blood.* (L'Union Méd., tome x., 1856.)
3. Brown-Séquard: *On the Properties and Uses of the Red Blood and of the Dark Blood.* (Compt. Rend., tome xlv., Oct. 19, 1857.)
4. Meyer, L.: *On the Gases of the Blood.* (Henle and Pfeufer's Zeits., f. Ration. Med., Band viii., p. 256, 1857.)
5. Picard: *On the Presence of Urea in the Blood, and on its Diffusion through the Organism.* (Strassbourg, 1856; and Canstatt, l. c., p. 169.)
6. Boner: *The Stasis in the Web-Membrane of the Frog, according to Experiments.* (Würzburg, 1856; and Canstatt, l. c., p. 101.)

7. **Scherer**: *Chemical Examination of Human Lymph.* (Verhandl. d. Würzb. Gesellsch., Band vii., p. 268; and Schmidt's Jahrb., Band xlv., p. 149.)
8. **Moleschott**: *On the Influence of Warmth on the Excretion of Carbonic Acid in Frogs.* (Moleschott's Untersuchungen, Band ii., p. 315, 1857.)

Nasse, assisted by Stöltzing, counted the blood globules of several human subjects, and of various animals, according to Welcker's method. The following are the figures:—

	Number of blood globules in 1 cubic millimètre.
1. Blood of man	4·502650
2. Blood of dogs	4·983000
3. Blood of oxen	4·899700
4. Blood of calves	5·092300
5. Blood of swine	5·442740
6. Blood of rabbits	4·866800
7. Blood of fowls	3·863600

The average specific gravity was, for

	The Blood.	The Serum.
Man	1·05977	1·02781
Dog	1·06107	1·02503
Ox	1·05549	1·02697
Calf	1·04858	1·02449
Pig	1·06364	1·03034

The same learned author ascertained also the amount of solid substance contained in the blood globules. As we are unable to describe the process and to give the figures in detail, we will only mention that the blood globules of man possess the greatest amount of solid substance; after these follow those of the dog, while those of the calf appear to be the lightest.

Parchappe has presented us with an elaborate essay on the constituents of the blood. He vindicates for himself the merit of having first pointed out the sources of error in the method of analysis introduced by Prévost-Dumas, without appearing aware that Lehmann had already several years before him most decidedly exposed the mistakes in question. Thus Parchappe urges the necessity of not referring to the serum of blood the fluid appertaining to the globules, as only in this manner the true proportion of the blood globules to the blood plasma can be found. The quantity of fibrin, on the other side, is to be considered not only in its relation to the whole amount of blood, but also to that of the plasma alone. In order to ascertain the proportion of fluid belonging to the globules, the author allows the blood to coagulate and stand for twenty-four hours, he then pours off the serum, divides the crassamentum into small slices, places these for twenty-four hours on thick bibulous paper, and then weighs them. From the figure thus obtained the proportion of the crassamentum to the serum is calculated. That in this proceeding no heed is taken of the serum which remains *between* the single globules, is evident; Parchappe's method does, therefore, likewise not exhibit a correct proportion between the globules and the serum. We are unable to follow the author through his researches; we beg leave, however, to copy the following table of the constitution of the blood of healthy males and females:—

	I. Blood of males. (The average from 12 analyses.)	II. Blood of females. (The average from 7 analyses.)
Water of the blood	768	794
Solid constituents in the dried state	232	206
Proportion of the moist cells and the fibrin obtained by weighing the pieces of crassamentum	529	490
Proportion of the serum	471	510
Dry blood-cells	181·0	153
Water of the blood-cells	340·8	329·8
Therefore moist blood-cells	521·8	482·8
Dry fibrin	3·0	3·0
Water of the fibrin	7·2	7·2
Albumen, extractive matter, and salts in the dry state	48·0	50·0
Water of the serum and its constituents	420·0	457·0
Proportion of the plasma	478·2	517·2

Brown-Séquard communicates several observations which strengthen him in the view that blood charged with oxygen, whether arterial or venous, has the power of re-establishing the vital properties of the contractile and nervous tissues, when applied within a certain space of time, after they have lost these properties. After having repeated Sir Astley Cooper's experiments, that animals die from asphyxia, when circulation is stopped in their four encephalic arteries, and that they recover almost immediately if the circulation is quickly re-established,—Brown-Séquard ascertained that if the circulation takes place again a few minutes after the last respiratory movements had ceased, life does not re-appear. But the red blood then still possesses the power of re-establishing life, as insufflation of the lungs causes energetic movements of the limbs, while the head remains at rest as long as the pressure on the arteries continues; but as soon as the latter is removed, the encephalon resumes its functions, and the animal may be restored to full life, even fifteen minutes after the commencement of the compression. The same author found also that in heads separated from the trunk, injections of red blood—i.e., blood charged with oxygen—may reproduce the actions of the encephalon (respiratory movements of the face, movements of the eyes, &c.). Further experiments have shown, 1. That the presence of fibrin in the blood is not necessary for this effect; 2. That serum alone does not possess this power; 3. That the blood richest in oxygen and globules does possess it in the highest degree—the globules acting probably only as bearers of oxygen. Another series of experiments regarding the properties of red and black blood, leads Brown-Séquard to the inference, that the red blood increases the vital properties by nourishing the tissues, but that it is incapable of making these properties appear by stimulating them; that the black blood is an energetic stimulant of the nervous centres, and also, but in a less degree, of the nerves and contractile tissues, but that it does not possess—or at least only in a small degree—the power of maintaining or regenerating the vital properties.

L. Meyer communicates some experiments, performed in Professor Bunsen's laboratory, on the absorption of gases by the blood, and on the state in which they are contained in it. The author arrives at the conclusion, that the absorption of oxygen is independent of, or at all events only to a very slight degree dependent on, the pressure of the atmosphere, but that it is regulated by the composition of the blood itself; that an alteration in the latter must therefore exercise a very important influence on the absorption of oxygen. Regarding the carbonic acid, Meyer inclines to the view, "that the immission and emission of this gas is due to a simple act of absorption." The oxygen gas is considered as entering already immediately after its absorption into some kind of chemical combination with a constituent of the blood. This combination, however, appears to the author as a very loose one: in the process of nutrition, probably under the influence of some acid, therefore not within the vessels, he thinks that a firmer combination, a real oxidation of some constituent, takes place.*

Picard performed a series of experiments on the presence of urea in the normal and in the morbidly-altered blood. The quantity of urea in one hundred parts of the blood of five healthy persons was 0·0165, 0·0142, 0·0153, 0·01774, and 0·0169; while the quantity of urea in the urine of twenty-four hours of the same individuals varied from 18·81 grammes to 38·42 grammes. In a case of amenorrhœa of a strong woman of twenty-eight years, the urea of the blood amounted to 0·029 per cent.; that in the urine of twenty-four hours to 23·65 grammes. In a girl of twenty years, affected with amenorrhœa, the per-centage in the blood was 0·026; the quantity in the urine, 18·46 grammes. In a healthy pregnant woman of twenty-nine years, he found 0·0113 per cent. for the blood, and 17·16 grammes for the urine of twenty-four hours: the blood of the placenta yielded 0·062 and 0·028 per cent.; the fœtal blood, 0·027 per cent.; the blood of a lying-in woman two days after delivery, 0·0187 per cent.; while the blood of the placenta had contained 0·028 per cent. Picard infers from his researches that the amount of urea contained in the normal blood may considerably vary under the influence of food, constitution, temperament, sex, and age.

The author's results regarding the proportion of urea in the renal artery and vein will be found under IV.

Boner produced the stasis in the capillaries of the frog by means of various irritant substances. He is of opinion that the stasis does not depend on the action of the heart and the influence of the nervous system, but on the increased adhesion between the blood corpuscles. This change in the cohesion is caused by the exaggerated exosmosis depending on the action of the irritant substances.

Scherer presents us with an analysis of human lymph, without, however, stating from which part of the body it had been obtained. The fluid separated into a pale reddish coagulum, and a limpid, pale yellow, slightly alkaline serum. Fat globules were present only in very small quantity. One thousand parts of lymph were composed of—

Water	957·60
Solids	42·40
Fibrin and lymph globules	0·37
Albumen and extractive matters	34·72
Inorganic substances	7·31

The ashes of the serum contained no carbonic acid, much chlorine, phosphoric acid and potash, a small amount of earthy phosphates, and iron.

Moleschott's experiments, performed with the assistance of Meier and Neukomm, his pupils, prove that frogs under the influence of a higher temperature excrete more carbonic acid than under that of a lower temperature, and that the increase in the excretion of carbonic acid bears a proportion to the increase of warmth. We find, therefore, in this respect, an analogy between frogs, the other cold-blooded vertebrate animals, the invertebrate classes, and the hybernating animals (Spallanzani, Treviranus, Saissy); while man and the warm-blooded vertebrata exhibit the opposite phenomenon (Regnault and Reiset, Letellier, Lehmann, Vierordt). The cause of this difference may be understood, if we consider that the temperature of the cold-blooded animals depends to a great degree on the warmth of the atmosphere; that their body becomes warmed by a higher external temperature, and that increased warmth alone is a promoter of metamorphosis of matter. Another circumstance of importance is that the amphibia excrete a comparatively large proportion of carbonic acid through the skin; and from Gerlach's[*] researches on horses, we may infer that mammalia, too, excrete a larger amount than usual through the skin when the temperature of the latter is elevated beyond the average.

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* Conf. this Journal, No. xxxix. p. 243.

IV. SECRETION, EXCRETION, METAMORPHOSIS OF MATTER.

1. Longet: *On the Sulphocyanide of Potassium as a Normal and Constant Element of Saliva.* (Journ. de Connaiss. Méd, Mars 10, 1856; and Canstatt, l. c., p. 181.)
2. Dalton, J. C.: *On the Constitution and Physiology of the Bile.* (The American Journal of Med. Science, October, 1857.)
3. Marcet: *On the Immediate Principles of Human Excrements in the Healthy State.* (Trans. of the Royal Society, p. 403, 1857.)
4. Davy, John: *On the Urinary Secretion of Fishes.* (Trans. of the Royal Society of Edinburgh, vol. xxi., p. 543.)
5. Léconte: *Researches on the Urine of Women during Lactation.* (L'Union Méd., No. 76, 1857.)
6. Neubauer: *On the Earthy Phosphates of the Urine.* (Erdmann's Journal, Band lvii.; and Canstatt, l. c., p. 185.)
7. Hammond: *Excretion of Phosphoric Acid by the Kidneys.* (North American Med.-Chir. Rev., vol. ii., p. 730, 1857.)
8. Picard: l. c., sub. iii.
9. Neubauer: *On the Decomposition of Uric Acid in the Animal Organism.* (Liebig's Annalen, vol. xcix., p. 206; and Canstatt, l. c., p. 189.)
10. Bechamp: *On Albuminous Substances, and on their Transformation into Urea.* (Thèse, Strassbourg, 1856; and Virchow's Archiv, Band xi., p. 476, 1857.)
11. Kuhne: *On Artificial Diabetes in Frogs.* (Göttinger Anzeiger, September, 1856; and Canstatt, l. c., p. 96.)
12. Schiff: *Experiments on the Origin of the Sugar in the Urine in Artificial Diabetes.* (Göttinger Anzeiger, October, 1856; and Canstatt, l. c., p. 97.)
13. Poggiale: *On the Action of Alkalies on the Sugar in the Animal Economy.* (Compt. Rend., Février, p. 198, 1856; and Canstatt, l. c., p. 163.)
14. Mialhe: *On the Chemical Use of Carbonic Acid in the Animal Economy.* (L'Union Méd., Août, 1856; and Canstatt, l. c., p. 164.)
15. Poggiale: *Note on the Action of Alkalies on Sugar.* (Moniteur des Hôpit., No. 103, 1856; and Canstatt, l. c., p. 165.)
16. Buchheim: *On the Passage of some Organic Acids into the Urine.* (Archiv f. Phys. Heilkunde; New Series, vol. i. p. 122, 1857.)

Longet presented to the Académie des Sciences a Memoir on Saliva, containing the following views: 1. The sulphocyanide of potassium is a constant and normal constituent of the saliva; 2. It is found not only in the saliva of the mouth, but also in that of the parotids, the submaxillary and the sublingual glands; 3. Its presence is characteristic of the secretion of saliva, as it is not found in any other fluid of the body; 4. The proportion in which it exists in the saliva is independent of age and sex, &c., dependent only on the state of concentration of the saliva; 5. In very diluted saliva it may escape discovery, but by an artificial concentration the reaction may even then be obtained; 6. The state of the teeth is without influence on its presence; 7. It is not the product of decomposition of the saliva; 8. The saliva of fasting persons is best suited for the purpose of isolation of the sulphocyanide of potassium; 9. Amongst the salts of iron, the chloride is the best reagent; the reaction produced by it does not depend on the presence of acetates of alkalies.

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[*] Müller's Archiv. 1851.

We are obliged to content ourselves with the mere quotation of Dalton's paper, which, however, we do with the less scruple as it adds little to what is already known on the subject.

Marcet has continued his researches on human excrements since the publication of his former memoir on the same subject.* Alcohol and ether were the principles employed for conducting the analysis. The results obtained are as follows: 1. Margarate of lime, phosphate of lime, and margarate of magnesia were discovered to be three immediate principles of human evacuations; 2. The author found a new and simple method for obtaining excretine—namely, by reducing the temperature of the alcoholic extract of fæces. He convinced himself that nitrogen does not enter into the composition of excretine; that 100 parts contain, according to calculation—carbon, 80·969; hydrogen, 13·495; sulphur, 2·768; oxygen, 2·768. 3. The fact, that vegetable food increases the presence of margaric acid (Lehmann), has been confirmed. Marcet relates in the same essay a fact which, though not in immediate connexion with the investigation of the immediate principles of fæces, deserves being mentioned here—namely, his discovery of the presence of cholesterine in the spleen.

J. Davy examined the contents of the urinary organs of various fishes, "the salmon, sea-trout, charr, common trout, pike and perch, the skate, ling, conger, cod, pollack, haddock, turbot, bream, and mackerel." Of these the salmonidæ, pike, ling, and ray have a small urinary bladder; the other fishes named seem to be destitute of such an organ, or it is so small as to have escaped observation. In the very small bladder of the salmonidæ no fluid was found collected; in that of a trout (*Salmo fario*), taken when in the highest condition, only a small quantity of mucous-like matter was found, which did not manifest any trace of lithic acid (tested by nitric acid and heat). The urinary bladder of the perch (*Perca fluviatilis*) presented a fluid, in which the presence of urea was rendered probable, while lithic acid appeared to be absent. In the pike (*Esox lucius*) the bladder was found empty, a small quantity of mucus-like substance from the ureter exhibited the reaction of lithic acid. From the comparatively large urinary bladder of a ling (*Lota molva*) four feet long, taken in June, "about a drachm of nearly colourless fluid was obtained, in which a few flakes resembling lymph were suspended." The search for lithic acid was performed with a negative result. The coagulation by heat and nitric acid indicated the presence of albumen. "The alcoholic solution, after the separation of the precipitated albumen," the author continues, "evaporated to dryness at a low temperature, yielded, after the addition of a minute portion of nitric acid, crystals which, seen under the microscope—they were too small to be seen without this aid—resembled so closely those of nitrate of urea, that I had little hesitation in coming to the conclusion that they were this compound." In the bladder of the common ray (*Raia batis*) a fluid was contained which gave traces of albumen, urea, and common salt, but none of lithic acid. In the ureters of the fishes destitute of urinary bladder, neither urea nor lithic acid was detected. The chemical examination of the kidneys of only one haddock was performed, without, however, finding either urea or lithic acid. The inferences drawn by the author himself are:—"1. That the urinary secretion of fishes is very limited as to quantity. 2. That it is commonly liquid. 3. That the nitrogenous compound eliminated is variable, either urea or a lithate (the latter probably very seldom), or some nearly allied compound of azote."

The inferences drawn by Léconte from his researches on the urine of nursing women, are in opposition to the statements made by Blot regarding the presence of sugar in such urine.* 1. In none of his numerous examinations Léconte found sugar, either by other means of analysis or by the process of fermentation. 2. All urines can reduce the blue liquids which are not freshly prepared; the causes of this reduction may be various; uric acid appears to him the most energetic, as this substance reduces also the freshly prepared blue liquids. 3. The urines of women while in the state of lactation, contain less urea and more uric acid than the normal urines, by which circumstance the reduction of the blue liquids is facilitated. 4. The quantity of water and solid substances in the urines of nursing women is almost the same as in normal urines.

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* Conf. this Journal, No. xxix., p. 270. 1855.

Neubauer communicates his researches on the amount of *earthy phosphates* excreted through the urine within twenty-four hours. A grown-up person between twenty and twenty-five years of age, when living on mixed diet, excretes, according to these researches:—1. 0·9441 to 1·012 gramme of earthy phosphates—0·0150 gramme to 1 kilogramme of man. 2. 0·31 to 0·87 gramme of *phosphate of lime*—0·0045 gramme to 1 kilogramme of man. 3. 0·64 gramme of *phosphate of magnesia*—0·00998 gramme to 1 kilogramme of man. 4. The ingestion of salts of lime does not increase the quantity of earthy phosphates in the urine. 5. In pathological conditions, the amount of earthy phosphates appears to vary considerably, as also the relative proportion between the phosphates of lime and the phosphates of magnesia.

Hammond, in his researches on the excretion of phosphoric acid, divides the day into three periods:—1. Morning, from 7 A.M. to 1 P.M. 2. Evening, from 1 P.M. to 10 P.M. 3. Night, from 10 P.M. to 7 A.M. He took breakfast at 7 A.M., luncheon at 1 P.M., dinner at 5 P.M. While the experimenter was under the usual influences — 1. The quantity of urine excreted was highest for the evening period, next highest during the night, and lowest in the morning. 2. The evening urine was of highest specific gravity, the night urine somewhat less, and the morning urine lowest. 3. The evening urine contained the greatest amount of phosphoric acid, the morning urine the next largest, the night urine the smallest. 4. The weight of the body was greatest at evening, next greatest at night, and smallest in the morning. When *physical exercise* was taken during the morning hours, which usually had been employed in studying, the course of living in other respects remaining the same — 1. The quantity of urine, its specific gravity, and amount of phosphoric acid became considerably increased in the morning period. 2. A reduction of the amount of urine and phosphoric acid was observed in the evening period. 3. At night the urine and its specific gravity fell to their minimum, while the phosphoric acid rose slightly over the evening average. 4. For the whole twenty-four hours there was an increase in the quantity of urine, a slight increase in the specific gravity, and a very considerable increase in the amount of phosphoric acid excreted.

The blood of the renal artery of dogs contains, according to Picard's analysis, 0·0365 per cent. to 0·04 per cent. of urea, that of the vena renalis of the same animals, 0·0186 per cent. to 0·02 per cent.; the blood passing through the kidney loses, therefore, about one-half of its per-centage of urea. Extirpation of both kidneys was followed by sickness, diarrhœa, depression, convulsive movements, and death within twenty-four hours. The substance vomited, after five hours did not manifest any traces of urea, but the fæcal matters contained 0·129 per cent. As the proportion of the urea in the blood was increased only by 0·009 per cent. after the extirpation of the kidneys, Picard infers that the greater part of the urea had been removed by the stools. Respecting the formation of urea in the organism, Picard is of opinion that it is formed by the metamorphosis of the muscular tissue, not at the immediate expense of the albuminous constituents of the food.

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* Conf. this Journal, No. xxxvii. p. 250.

With regard to the quantity of urea contained in various fluids of the organism, Picard obtained the following figures:—

	per cent.
In the saliva	0·035
„ bile	0·030
„ milk	0·0113
„ fluids of the eye	0·500
„ perspiration	0·088
„ fluid of blisters	0·060
„ fluid of ascites	0·015
„ fluid of the amnion	0·026 0·035

Neubauer proves, by experiments on rabbits, that the ingestion of uric acid produces a considerable increase in the excretion of urea. Two rabbits, the urine of which contained 1·3 to 1·7 grain of urea for twenty-four hours when they received their usual food, were first submitted to a diet consisting of wheat-bread; the urine, which had been formerly alkaline, became acid, the quantity of phosphoric acid exhibited an increase, that of urea rose to 2—2·5 grammes, oxalate of lime being present in both cases. After this the animals received, in the course of five days, with their food,12 grammes of uric acid. The amount of urea rose during this period to 3·9—4·0 grammes per diem, while the other constituents of the urine did not exhibit any marked alteration. As soon as the ingestion of uric acid was left off, the amount of urea fell to its previous average. In another series of experiments, the rabbits were at first fed with carrots, when the average amount of urea was 1·34 grammes; then to their allowance of carrots for two days 24 grammes of uric acid were admixed. The urine remained alkaline, the quantity of urea rose during the first three days to 5·3, 8·5, and 6·2 grammes, after which it fell again to 1·33 grammes. The surplus of urea during the three first days amounted to 15·98 grammes. As 24 grammes of uric acid correspond to 17·13 grammes of urea, the difference between this and the quantity really excreted is only 1·15 gramme. The amount of oxalic acid did not appear increased. These results, the author argues, entitle to the inference, that in the normal animal organism uric acid is decomposed almost completely into urea and carbonic acid; "that, however, oxalic acid, too, may appear, and that it must do so whenever the process of oxidation is retarded, which is the case already during sleep, and in many pathological conditions."

In addition to these experiments, Neubauer communicates some observations regarding the decomposition of the uric acid under the influence of the hypermanganate of potash, showing that according to the temperature, the concentration, and other conditions, the decomposition of the uric acid may be different. Thus, if rapid oxidation is effected, the products are urea, oxalic acid, and carbonic acid; while, under the influence of slow oxidation, carbonic acid, oxalic acid, allantoin, a nitrogenous syrup-like acid, and only a small quantity of urea, are obtained, a part of the uric acid remaining undecomposed.

Bechamp entertains the view, that the oxygen obtains its great power of inducing combustion and decomposition within the organism by the circumstance that it becomes condensed in the blood globules (acting as porous substances), and undergoes there a kind of alteration; that thus a more simple oxygen is formed, which in *statu nascenti* causes decomposition of albuminates within the blood globules. The principal value of Bechamp's researches lies in the fact that he proves the formation of urea from albumen, fibrin, gluten, &c., by means of the hypermanganate of potash. For the chemical process by which this result is obtained we must refer to the essay itself.

Kühne produced the artificial diabetes in frogs by piercing a strong pin through the region of the atlas. The sugar appeared in general after four or five days, the urine became at the same time more acid; this morbid condition ceased after a duration of about three days. The place to be punctured is situated, according to Kühne, on the bottom of the sinus rhomboidalis.

Schiff's experience differs from this in so far as he found the place for puncture to extend from the commencement of the upper third of the medulla oblongata into the portion of the medulla spinalis corresponding to the third dorsal vertebra. Schiff's experiments corroborate the view that the liver is the laboratory of the sugar. As soon as the sugar commenced to pass through the urine, the liver was drawn out of the abdomen, and in a part of the animals all the vessels of the liver were tied, while in the rest of them the ligature was removed again immediately after it had been applied. The sugar disappeared from the urine of the former number of animals within three hours after the application of the ligature, while it continued to be secreted by the rest until to the end of the fourth day. The fact that no sugar is found in the urine when the ligature is applied, not to all the vessels, but only to a part of them, leads Schiff to the inference that, by the puncture of the medulla oblongata, the combustion of the sugar in the blood is not prevented, but that the formation of sugar in the liver is increased.

Poggiale performed a series of experiments in order to examine the correctness of Mialhe's theory, that the combustion of sugar in the blood is effected by means of the alkalies, and that the passage of sugar into the urine takes place only when the proportion of alkalies in the blood is diminished. I. Admixture of a large amount of carbonate of soda to the food of dogs did not cause any diminution in the per-centage of sugar contained in their blood. II. The blood of dogs fed with starch, sugar, and carbonate of soda, contained much sugar; their urine from 0·5 to 0·7 per cent. of sugar. III. The result was the same when half a gramme of grape-sugar mixed with one gramme of carbonate of soda as when grape-sugar alone was injected into the blood. IV. Out of the organism the decomposition of sugar by means of the carbonates of alkalies takes place only at a temperature near to that of boiling water. Poggiale concludes from all this, that Mialhe's views regarding the state of alkalescence of the blood in diabetes are unfounded.

Mialhe replies, that Poggiale's experiments on dogs had led to negative results because it had been neglected to cause the animals to take more exercise, and thus to incite their respiration and circulation. The circumstance that alkalies required so high a temperature to effect oxidation of sugar out of the organism, is not admitted by Mialhe as a valid objection to his theory, because the conditions within the body are different from those without.

Poggiale, however, rejoins, with much reason, that the view concerning the necessity of the alkalies for the combustion of sugar, need not be adopted before Mialhe has shown that oxygen alone, without the co-operation of alkalies, has no effect on grape sugar.

Buchheim and Pietrowski examined some points regarding the passage of organic acids into the urine. The result of the author's researches on oxalic acid is in accordance with that obtained by Wöhler,* in so far as a part of the oxalic acid ingested was found again in the urine; but Buchheim did not obtain a larger amount, whether the acid had been taken as such or combined with alkalies. The circumstance, that the quantity contained in the urine after the ingestion of oxalate of lime was much smaller, is easily explicable by the greater insolubility of this salt. It is of interest to remark that the quantity of lime excreted through the kidneys appeared to be uninfluenced by the presence of the larger amount of oxalic acid, part of which existed in an insoluble condition, probably as an alkaline salt. The experiments performed with tartaric acid and its salts prove that part of the acid passes into the urine, whenever it is taken in large quantity, but the amount contained in the urine forms only a few per cents. of the total amount taken, the rest having probably undergone decomposition during its passage through the organism. The circumstance of the acid being taken as such, or in the form of one of its salts, appears to exercise no influence on the amount excreted. Citric acid, when taken alone, or in its combinations with soda and magnesia, in doses from ten grains to sixty grains within a few hours, was not found again in the urine. Benzoic acid, as observed already by others, is excreted in the shape of hippuric acid. The benzoates of soda, of ammonia, of magnesia, and oxide of iron, lead likewise to the excretion of a corresponding amount of hippuric acid in the urine. Hippuric acid appeared in the urine in the quantity in which it had been taken; the whole amount of the acid was likewise found in the urine, when it had been ingested in combination with alkalies. After the ingestion of fifteen grammes of succinic acid within ten hours, no trace of this acid could be discovered either in the urine or in the alvine excretions. The same negative result was obtained in the experiments with succinate of soda and succinate of lime. We may therefore conclude that succinic acid undergoes a rapid decomposition in the human organism.

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* C. J. Wöhler: **Ueber den Uebergang von Materien in den Harn; Tiedemann and Treviranus: Zeitschrift für Physiologie, Band I.**

V. NERVOUS SYSTEM.

1. CHAUVEAU: *On the Functions of the Spinal Marrow.* (L'Union Méd., tome xi., 1857.)
2. SCHIFF: *On the Æsthesodic Nature of the Spinal Ganglia.* (Moleschott's Untersuchungen, Band ii., p. 56, 1857.)
3. PINCUS: *Experiment on the Pneumogastric and Sympathetic Nerves.* (Vratislaviæ, 1856; and Canstatt, l. c., p. 136.)
4. SAMUEL: *De vi Nervorum ad Vasa, Temperaturam et Secretiones.* (Berolini, 1856; and Canstatt, l. c., p. 136.)
5. KNOCH: *De Nervi Sympathici vi ad Corporis Temperiem.* (Dorpati, 1855: l. c., p. 136.)

Chauveau endeavours in the present paper to refute two of Brown-Séquard's principal statements—1. The crossing of the sensitive impressions immediately after their intromission into the spinal marrow; and 2. Their conduction to the brain by means of the central grey substance. With regard to the *crossing of the sensitive impressions* immediately after their entrance, Chauveau shows, by section of one-half of the spinal marrow in horses and pigeons, *a*, that the sensation of the parts of the same side supplied by nerves from below the point of section is destroyed; *b*, that the movements caused by pinching or other irritation of this side, are reflex movements; *c*, that the sensation of the side opposite to the section is not destroyed, as it ought to be, according to Brown-Séquard's view. Concerning the *grey substance*, the author repeats his former assertion,* that it has nothing to do with the transmission of sensitive impressions. He performs the principal experiment on which Brown-Séquard's view is based—i.e., the dissection of the anterior, lateral, and posterior columns of the dorsal portion of the spinal marrow, so that only the central grey substance remains intact; he explains the phenomena observed on such an animal, and interprets them as caused by reflex action. The phenomena of real pain, whenever they are manifested, follow the purely reflex movements. "Il y a," Chauveau adds, "encore ici irradiation de l'excitation dans la partie antérieure de la moëlle, par la substance grise centrale, et réflexion de cette excitation non sentie sur des organes sensibles, où les contractions qu'elle suscite causent de la douleur." The author farther makes, in a pigeon, a transverse section of the whole lumbar portion of the spinal marrow, with the exception of the posterior and lateral white columns of the left side. He then shows that the sensation of the left foot is preserved, although not a trace of grey substance had remained uncut.

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* Conf. this Journal, vol. xxxix. p. 251.

"Æthesodic," Schiff calls, with Brown-Séquard,* those parts "which are endowed with the faculty of conveying sensation, the local irritation of which, however, does not cause any sensation." As Brown-Séquard had contended that the spinal ganglia themselves are not sensitive, while he had found the posterior roots on either side of the ganglia very sensitive, Schiff exposed several spinal ganglia in frogs, and found in every instance so marked a sensibility in these ganglia, that he appeared at a loss to explain how Brown-Séquard could have arrived at another inference.

It will be remembered that Brown-Séquard, as well as Schiff, had attributed this curious "æthesodic" nature to some parts of the grey substance of the spinal marrow, while Chauveau's experiments make the existence of such a quality in the grey substance at all events very doubtful.

Pincus communicates a series of experiments on the influence of the vagi and the sympathetic nerve on the organs of nutrition. Section of both pneumogastric nerves, below the diaphragm, in rabbits, cats and dogs, was not followed by loss of the motile power of the stomach; but the gastric juice secreted was alkaline: did not possess the virtue of digesting albumen and coagulating milk. Hyperæmia, as well of the stomach as also of the upper part of the small intestines, was among the prominent symptoms. Some small effusions of blood and ulcerations were found on the mucous membrane, especially in the rabbits. Extirpation of the solar plexus is always followed by more intense alterations than are observed after section of the vagi. Extirpation of the mesenteric and aortic plexuses acts in a similar manner on the phenomena of nutrition of the lower part of the duodenum and the upper part of the colon. Transverse section of the spinal marrow on various points does not cause any alteration in the circulation and nutrition of the intestinal tube. The author from this concludes that new nutritive fibres for the intestines are formed in the ganglia of the abdominal cavity. He finds no proof of the existence of a common centre for the nutritive and vascular nerves of the intestinal tube.

Samuel corroborates the experience of others, that a high degree of hyperæmia of the intestines, with increased secretion (fluid, diarrhœa-like contents), is caused by extirpation of the solar plexus.

The dissertation of Knoch, composed under the auspices of Bidder, gives evidence of the correctness of the observation, that section of the left sympathetic of the neck is followed by increased warmth in the corresponding half of the head. This increase of temperature did not always appear immediately after the operation. In one case the warmth in the nose reached its maximum only on the following day. Knoch describes the influence exercised by the sympathetic on the ear of rabbits and on the condition of their eyes. He further describes some experiments regarding the irritation of the regio ciliospinalis, which show that only irritation of the anterior, and not of the posterior, roots influences the pupil. His researches lead him likewise to the view that the fibres acting on the pupil are derived from the spinal marrow—not from a spinal ganglion. Regarding Meissner's important communication on the richness of the areolar tissue between the muscular and mucous coats of the intestinal canal in nerves and minute ganglia, we refer to page 510 of the preceding volume of this Journal. [We regret that we are compelled to postpone the remainder of this Report.—Ed.]

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* Conf. Comptes Rendus, tom. xxxviii. p. 930.

HALF-YEARLY REPORT ON MATERIA MEDICA AND THERAPEUTICS.

By Robert Hunter Semple, M.D.
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I. *On the Value of Mineral Waters in the Treatment of Paralysis.* By Dr. Durand-Fardel. (Bulletin Général de Thérapeutique, April 30th, 1857.)

The author of this paper, after dividing paralysis into two kinds, one being dependent upon disease in the brain, and the other associated with some general constitutional disturbance, as hysteria, chlorosis, &c., proceeds to point out the special objects to be attained by the use of mineral waters in the treatment of paralysis caused by disease of the nervous centres. His views are as follows:—The indication of treatment by chemical waters during the period of reparation of cerebral lesions, is perfectly well understood. This kind of medication, considered generally, increases organic activity, and if it does not exceed due bounds, appears to be proper for favouring and hastening the phenomena of reparation, at the same time that it promotes by direct action the return of the injured functions. It appears legitimate to admit that such is the case, and it may be conceived that when this favourable action coincides with the formal and spontaneous progress of the organism in the same direction, very striking and satisfactory results may be observed of chemical medication in the treatment of paralysis. It must be admitted that this kind of treatment succeeds only in proportion as it proceeds in a consentaneous action with the curative tendency of the organism. If it developes this tendency, or if it only assists it, we believe in this principle, that the excellence of any kind of treatment can be judged only in so far as it may be combined in its action with the spontaneous progress of the organism in the direction of cure. If there should result any confusion in our analysis, and if we do not know exactly what to attribute to the treatment and what to refer to the organism, it is certainly an inconvenience, but one of secondary importance, the chief point being that the results are as satisfactory as possible. Dr. Durand-Fardel then shows the particular kinds of mineral waters which should be employed in the different forms of paralysis.

The waters containing chloride of sodium are specially adapted for the treatment of paralysis. They present themselves in the form of *strong* waters, as those of Balaruc, Bourbonne, Bourbon-l'Archambault, La Motte, Wiesbaden, &c.; and *weak* ones, as those of Néris, Luxeuil, Bourbon-Lancy, Wildbad, Gastein, &c. The sulphurous waters, although generally regarded as among those which are suitable for paralytic cases, have no claim to such a merit, according to Dr. Durand-Fardel. The weakly mineralized waters are especially applicable to paraplegia, and the strong waters containing chloride of sodium appear to have a special action in the treatment of hemiplegia or cerebral paralysis. The thermal stations where the special treatment of hemiplegic paralysis is conducted, are those of Balaruc, Bourbon-l'Archambault, Bourbonne, and La Motte. These waters are very hot—between 48° and 60° Cent.—rather unequally mineralized, but all containing a predominant quantity of chloride of sodium. M. Caillat recommends the following thermal treatment at Bourbon-l'Archambault in hemiplegia: one to four glasses of water to be taken internally every day; a bath, of from 34° to 35° C., for ten minutes to a quarter of an hour; douches upon the paralyzed limbs from ten minutes to a quarter of an hour, from a height of two metres, and from 33° to 34° C.; leg-baths in the evening, in mineral water at 47°.

In 390 cases of hemiplegia from apoplexy, 26 were completely cured, 317 were decidedly relieved, and 47 were treated without success; one only died during the treatment.

The waters of La Motte are administered at a very elevated temperature, in baths and in douches, with sweating. The patients are subjected in general to the use of the baths at 35° to 37° C. for about three-quarters of an hour, and to six to twelve general douches at 45° to 48°, followed by wrapping in a woollen blanket, and sweating. During this time they take the mineral water internally in the dose of some glasses, with a purgative effect, which is sometimes very considerable. In 14 cases of hemiplegia, of which the history has been related, 4 were cured, 5 very much relieved, 3 a little relieved, and 2 have not experienced any appreciable effect.

The waters of Niederbronn are distinguished from the preceding by being cold, and although more feebly mineralized, are more distinctly laxative. It appears, in fact, that the laxative properties of the waters containing chloride of sodium are very far from being in exact relation with their general degree of mineralization, or the quantity of chloride which they contain.

After a brief exposition of the difference in the causes and progress of hemiplegia and paraplegia, Dr. Durard-Fardel concludes that the use of mineral waters is likely to be more advantageous in the latter affection than in the former, because in hemiplegia the cause of the disease is a serious, and sometimes incurable, lesion of the cerebral mass; while paraplegia, although often depending upon disease of the spinal cord, is sometimes due only to the irritation of nerves which come from the cord.

Rheumatic paraplegia is one of those affections which are most certainly benefited by thermal treatment. The waters of Toeplitz, in Bohemia, enjoy in Germany a great reputation in the treatment of paralysis; their efficacy is said by Dr. Schmelkes to depend upon their high temperature, and this author recommends baths to be employed at 28° to 30° R., with a simple excitement of the skin of half an hour's duration, and baths above 30° R., with brisk stimulation for fifteen minutes at most. Hysterical paralysis, according to M. le Bret, and in general every kind of paralysis depending upon nervous irritation, ought to be removed from the influence of the stimulating waters, that is to say, the active chlorinetted waters. M. Raoul-Leroy d'Etiolles advises the use of the sulphurous mineral waters in hysterical or chloro-hysterical paraplegia, and insists particularly on the efficacy of the waters of Baréges in rheumatic paralysis; but Dr. Durand-Fardel, while admitting their value in the latter class of cases, does not admit them to be equally efficient in hysterical affections. In paraplegia caused by exhaustion of the nervous system, the waters containing chloride of sodium have succeeded perfectly well; in such cases, M. le Bret has administered the waters of Balaruc in baths at 38° to 40°, or rather immersions of some seconds' duration, up to fifteen or twenty minutes at most. On emerging from the bath, each patient was wrapped up in a common blanket, and carried, if he could not walk, into his bed, where he soon experienced a powerful reaction. Senile paralysis without organic lesion, characterized by a general weakening of contractility, marked above all things in the lower limbs with palsy of the bladder and rectum, is sometimes remarkably modified by the strong waters containing chloride of sodium; in such cases a true restoration of the organism takes place. As to the treatment of paraplegia consequent upon organic lesions of the spinal cord, it is admitted that the thermal treatment, like every other method of medication, is unsatisfactory, because the diagnosis of these diseases is very difficult; but the monographs on mineral waters often mention beneficial results after treatment in cases of spinal irritation, spinal congestion, and particularly of myelitis. The mineral waters appear generally to be contra-indicated in cases in which abolition of movement is attributable to a mechanical cause, as displacement of the vertebræ, and tumour inside or outside the spinal canal. Nevertheless, M. Lhéritier relates some few observations in which the waters of Plombières have been employed with advantage in cases of paraplegia dependent on deviations of the spine or caries of the vertebræ. M. le Bret has, in the following terms, clearly indicated the conditions in which the thermal treatment may be applied in myelitis. At the end of certain acute cases of myelitis regularly and efficiently treated by habitual therapeutical means, when there remains a defect of harmony in locomotion, or, so to speak, a want of equilibrium between the muscular system of relation and the nervous incitement, a certain degree of inactivity of the intestine or the bladder; and in certain chronic forms of myelitis, it being understood that there is no advanced alteration of the spinal cord, or that, if it has existed, it is in course of reparation, as may be suspected by the absence of pain on the exploration of the spinous processes, on the return of the functions of the intestine and the bladder, and in subjects who are well constituted, and whose antecedents are favourable.

II. *On the Employment of Tartarized Antimony in the Treatment of Chorea.* By Dr. ADRIEN MARCOTTI. (Bulletin Général de Thérap., July 30, 1857.)

The author of this paper gives an historical account of the various authorities who have recommended tartar emetic in chorea, for which it was first employed by Laennec, under the influence of Rasori, who was then administering this drug in large doses. The results of two cases under the treatment of M. Boulcy, in the present year, at the Hospital Neckar, were quite favourable. In the first case, that of a young girl, the chorea had lasted a month, and was increasing in intensity. Large doses of the tartar emetic were given on two successive days, and thirty hours after the first administration of the medicine, all choreic movement disappeared. The patient was at first thrown into a considerable state of depression, but some moments of sleep sufficed to restore her, and the appetite was soon found to reappear. The muscular disorder disappeared, but a bad state of the constitution remained, and recourse was made to tonic medicines to improve her condition. The chorea reappeared under the influence of a fit of passion, but on the administration of the tartar emetic it again subsided. In the second case, the chorea was at first general, and almost immediately became partial. It resisted for six months and a half sulphurous baths, chalybeate tonics, and strychnine, and yielded in twenty-eight hours to the employment of tartar emetic.

III. *On the Therapeutical Action of Chlorate of Potash, with a New Mode of Administering it.* By Dr. DETHAN. (L'Union Médicale, June 4th, 1857.)

Dr. Dethan considers that chlorate of potash is a powerful sialagogue, and that its elective action on the bucco-pharyngeal mucous membrane is well marked. To this physiological action is added a very remarkable and valuable success in pathology; its rapid and incontestable effects in mercurial salivation, by checking the formidable mercurial affection, have permitted practitioners to continue the mercury without fear, and thus to contend without remission against the constitutional infection. As an especial and incontestable remedy in ulcero-membranous stomatitis, this medicine need not, according to the physicians of the Hôpital Sainte-Eugénie, be swallowed; its topical application is sufficient, and in a short time the mucous membrane recovers its normal qualities and functions. Dr. Dethan concludes that the chlorate of potash, administered under a special form, which would permit the local action to be exercised slowly and certainly, although leaving the medicine to be carried into the stomach in a state of solution with the mixed liquids of the salivary, buccal, and pharyngeal glands, would be the mode of administration which would combine all indications and all opinions. He therefore suggests the use of the remedy in the form of pastiles, so that the patient may have at hand a remedy against the injurious effects of a mercurial treatment which he may be undergoing. The experiments of Dr. Ricord, and the publications of M. A. Fournier, testify incontestably in favour of this successful simultaneous medication. In certain forms of angina attended with fibrinous exudations, it prevents the intimate adherence of the false membranes to the mucous membrane, and facilitates their expulsion, and assists the action of emetics. In this affection the topical action of the chlorate, favoured by the bruising between the teeth, the natural solution in the liquids of the mouth, and its penetration into all the points interested, will be certainly efficacious. In debilitating diseases, such as diphtheritis, and gangrene of the mouth, the child will find an agreeable and reparative kind of food, together with the most appropriate remedy hitherto discovered, against these diseases.

IV. *On the Value and on the Indications of Perchloride of Iron administered internally in the Treatment of Erysipelas.* (Bulletin Général de Thérapeutique, July 15th, 1857.)

The use of perchloride of iron in the treatment of erysipelas has lately been brought again into notice by the publication of a thesis by M. Louis Mathey, and by some observations made by M. Aran, physician of the Hôpital St. Antoine in Paris. M. Mathey relates ten cases of erysipelas treated with this medicine, and his conclusions are contained in the following remarks:—

The action of perchloride of iron on erysipelas is evident, and the course of the disease is modified a short time after its administration. In fact, on the second day, and sometimes even on the first, M. Mathey has seen the disease become limited and circumscribed, and its further progress arrested. As to the duration of the disease, the effect of the perchloride is still very remarkable: not only is the progress of the erysipelas sensibly modified from the first few hours which follow the administration of the medicine, but it is completely arrested; the radical cure of the disease is obtained in a very short time. It was observed that in ten rather severe cases of erysipelas treated by the internal use of perchloride of iron, three were cured in two days, three were cured in three days, two were cured in four days, one in five days, and one in seven days. It cannot therefore be denied that erysipelas is advantageously modified by the internal use of chloride of iron; that the cessation of the symptoms proper to erysipelas is sometimes very rapid after the administration of this medicine; that in a series of ten observations, made upon varied cases, this treatment never failed; that even where its efficacy may be doubted it has never given rise to any bad symptom; and that when administered in the dose of thirty drops to a healthy subject, it has never given rise to any painful sensation, and has never produced any notable functional disturbance.

M. Aran agrees with M. Mathey in never having observed any unfortunate result from the administration of the perchloride of iron in larger doses than those employed by M. Mathey—namely, thirty, fifty, sixty, and one hundred drops a-day, in certain exceptional cases. But a wider and more extensive experience of the employment of the perchloride has shown him that there are particular circumstances which favour the action of the medicine. M. Aran believes that it would be vain to expect advantageous results from the administration of perchloride of iron in all cases of erysipelas. He is convinced that some cases of erysipelas will not yield to this remedy; as, for instance, the cases which occur in young, strong, and robust subjects of a sanguine temperament, and which are accompanied by a well-marked inflammatory action. On the other hand, the cases of erysipelas which are developed in feeble, delicate subjects, of a well-marked lymphatic or scrofulous temperament; in individuals already weakened by previous diseases; the cases especially which exhibit, with well-marked tendency to spread, the œdematous form; and in which, even with a marked acceleration of the pulse, the arterial throbs are weak and easily depressed, or when fever is completely wanting, as happens sometimes in old persons; these cases are remarkably modified and often arrested in twenty-four, thirty-six, or forty-eight hours, by the administration of the perchloride. The erysipelas which is still more atonic, and which supervenes in the course of serious diseases, around punctures, abrasions, or lacerations of the skin, at other times even without appreciable causes, are amenable to the perchloride of iron. Lastly, the cases which, even when they show themselves in strong and robust subjects, after having been reduced by various and appropriate treatment, still linger on and pass from one part to another, throwing out unexpectedly its eruptions in places where the disease appeared to have been long extinguished; such cases are often terminated in twenty-four hours by the perchloride of iron.

Another point connected with this subject is the propriety of administering the perchloride as a prophylactic. "There are certain epochs and years," says M. Mathey, "when cases of erysipêlas of traumatic origin are multiplied to infinity, and show themselves in such great number, that the disease is truly epidemic. The application of a seton, a moxa, or a blister, is followed by erysipelatous inflammation: and, *à fortiori*, the great wounds united by sutures and bandages of diachylon are almost infallibly attacked with the disease. The surgeon who operates under these circumstances is pretty sure to see erysipelas among his patients. It would perhaps be proper to postpone the operation, but sometimes the case is urgent, and the surgeon would think himself fortunate and could act with more confidence if he could hope to put his patient beyond the reach of a troublesome complication; might we not, for the first few days which follow a delicate operation, and during which inflammation is to be feared, unite with soothing beverages some drops of perchloride of iron, because it is fully established that its use in moderate doses is not followed by any bad effect?"

V. *On the Inconveniences which follow the Application of the Salts of Lead to the Buccal Mucous Membrane.* By Dr. J. Delioux. (Bulletin Général de Thérapeutique, Sept. 15th, 1857.)

The principal inconveniences to be feared in the administration of saturnine preparations are the absorption of lead by the mucous membrane of the mouth, and the discoloration of the teeth. With regard to the first, the surface of the mouth, imperfectly protected by a delicate epithelium, and bathed by fluids the chemical constitution of which favours the solubility of metallic compounds, is in the most favourable condition for absorption, as indeed is known when that portion of the system is selected for the introduction of certain medicines into the system. This absorption takes place when the mucous membrane is quite sound, but it proceeds with much greater activity when the epithelial layer is destroyed. The coloration of the teeth is an inconvenience which always follows the contact of the preparations of lead. It is caused by the reaction upon the lead of the proteinaceous principles of the fluids of the cheeks, or of the tartar of the teeth; and its chemical origin is the formation of the sulphuret of lead. In order to destroy the black precipitate caused by the sulphuret, M. Delioux recommends the use of some chemical substance which forms a white precipitate with the salts of lead, and he has practically found that substances containing tannic acid are well adapted for the purpose. Under the influence of a decoction of red cinchona bark, the black tint of the teeth has disappeared instantaneously. In cases of this discoloration, Dr. Delioux's treatment has consisted in converting the black sulphuret of lead into the white tannate; while the tonic and astringent solutions have at the same time cured the stomatitis; and at the end of about a month the teeth have become perfectly white, while the mucous membrane has recovered its normal character in every respect.

VI. *On the Mineral Waters of Wildbad-Gastein.* By Dr. von Hönigsberg. (Zeitschrift der Gesellschaft. der Aerzte zu Wien, 1857.)

The most common application of the thermal waters of Gastein is in the form of baths, which are fitted up in the lodging-houses and hotels; but the use of the waters is not exclusively confined to the purpose of bathing, for they are also used for drinking. The waters are taken contemporaneously with the use of the baths, and are found especially useful in acute and chronic catarrh of the respiratory passages, in similar conditions of the stomach and bowels, and of the urinary apparatus, and also in spasm of the stomach, intestines, and bladder. Two springs in Gastein are appropriated to those who drink the waters. As a further means of cure, especially in neuralgia, rheumatism, gout, chronic swellings of the joints, and many diseases of the skin, the vapour-baths are found useful, without, however, possessing any specific operation. The country about Gastein is very favourable to the growth and feeding of cattle, and hence the Whey-treatment is conducted there with great success, in combination with the internal and external use of the waters.

VII. *On the Treatment of Menorrhagia with Ergot.* By J. Mc F. Gaston, M.D., Columbia. (Charleston Medical Journal and Review, July, 1857.)

The author of this paper, after giving to Dr. Churchill the merit of having first pointed out the value of ergot in menorrhagia, relates his own experience upon the subject. He tried it at first (1846) in the case of a young lady who had suffered from profuse flow of the menses for a considerable period, and under the use of the remedy she completely recovered, married, and had a family. The ergot was given with carbonate of iron, in doses of five grains of each, three times a day. Dr. Gaston has found the use of the ergot followed by beneficial results in every subsequent case of menorrhagia in which he has prescribed it. He has latterly given it in infusion, combined with the tincture of the sesquichloride of iron, which he thinks a preferable form of administration. When much nervousness was excited, valerian was combined with the ergot; and when there was great pain, opium was added with advantage. A discharge somewhat similar to menorrhagia occasionally occurs within the second month after delivery, which, if continued, may enfeeble the patient; and in such cases Dr. Gaston has employed the ergot and iron with excellent effect. The ergot is of course contra-indicated in pregnancy, unless it should be desirable to dislodge the fœtus. In a case of hæmorrhage, about the fifth month of pregnancy, which threatened to prostrate the patient, Dr. Gaston gave the ergot in doses of five grains, with one grain of opium, every two hours, and only three doses were taken when the child was expelled and the hæmorrhage ceased.

VIII. *On the Influence of Opium and the Essential Oils on the Tolerance and the Therapeutic Action of Antimonials.* By Dr. J. Delioux. (Bulletin Général de Thérapeutique, June 15th, 1857.)

Dr. Delioux, after alluding to the theoretical views of Rasori upon the action of tartar emetic, states that he is in the habit of prescribing together antimonial and opiate preparations, when the pain accompanying pleuro-pneumonia puts on a certain degree of acuteness, and far from observing any disagreement in their action, he has observed, on the contrary, a kind of reciprocal efficacy, the antimony acting upon the lung as well as if it were alone, and the opium assisting the more direct action of local bleedings and blisters. He has even applied a salt of morphia to the surface of one of the blisters, and the sedative effect which has followed its absorption has never opposed the lowering action of the antimonial salt. There is therefore no therapeutical antagonism between opium and antimony, since, in a given case of pneumonia, they may both act together or separately in effecting the cure. There is, nevertheless, between them a real pharmaco-dynamic antagonism; the one stimulates, the other weakens; the one stupifies, the other acts as an alterative. Opium, therefore, should not be misemployed in cases where stimulation is injurious. There are two usual compounds of opium and antimony—namely, when a certain quantity of syrup of opium or morphia is added to antimonial draughts, or when, in the form of pill, a dose of opiate extract is incorporated with the antimony. The indication for the use of opium in diseases of the respiratory organs is the existence of well-marked nervous symptoms, and therefore if the nervous element is wanting, opium need not be employed except to favour the tolerance of the antimony. But this tolerance may be established without the employment of opium. On the other hand, the nauseous taste of the tartrate of antimony promotes in a great degree the action of vomiting. This taste may be disguised by adding some aromatics to the antimonial mixture, such as the preparations of orange-flowers, mentha, canella, or lauro-cerasus. In whatever manner the action of the essential oils contained in these plants may be explained, it is clear that in many cases they not only correct the disagreeable taste of the tartrate of antimony, but they secure the tolerance of that drug, and render unnecessary the employment of opium. But the influence of essential oils has its limits, and in spite of their importance there are circumstances in which antimonial preparations in large doses cannot be supported except by being associated with opium. If the intolerance is manifested in the intestine by colic, or by excessive evacuations, the effect of opiate injections should be tried, and it is only when these fail that opium is administered by the stomach. If only nausea and vomiting prevail, which is ordinarily the case, Dr. Delioux first suspends the antimonial mixture, and afterwards prescribes a small dose of opium; when the vomiting is arrested, the antimonial mixture is resumed; if the vomiting returns, opium is again employed, and by this means the tolerance of the antimony is established. The opium therefore, assists materially the action of antimonial preparations in the diseases of the respiratory organs; the intolerance and the nervous element, if they exist, being removed by opium, the antimony remains alone opposed to the inflammatory congestion, and then it is seen distinctly whether it possesses the power of reducing this capital element of the disease.

IX. *Experiments on Colchicine, and the Comparative Action of the Dry Bulbs and the Seeds of Colchicum.* By Professor SCHROFF, of Vienna. (L'Union Médicale, June 9th, 1857.)

The colchicine employed was a light powder of crystalline appearance, of a clear yellow colour, of a very bitter taste, afterwards grating to the throat. It was not altogether pure, for then the substance is colourless and crystallizes in needles. It is soluble in water, alcohol, and ether; the watery solution has a feeble alkaline reaction. In order to study the taste of this substance, M. Heinrich took $\frac{1}{100}$th of a grain of colchicine, and soon after he experienced eructations and great nausea, with augmentation of the saliva. The nausea lasted some hours, even after supper, which was taken without appetite. The pulse fell gradually eleven pulsations in the first two hours. Eight hours afterwards the same observer took $\frac{3}{100}$ths, enveloped in a wafer; it was then half-past four o'clock in the afternoon. The pulse was not changed in the first two hours. Until eight o'clock in the evening, nothing was evinced except eructations and slight ptyalism; supper was taken without appetite. After ten o'clock there was broken sleep, from which M. Heinrich was awoke at half-past one by painful dreams; he had desire to go to stool, but he had scarcely left his bed when the nausea increased, bringing on a fit of vomiting for two minutes; at the same time there was a very soft and copious stool, accompanied with violent griping. This painful scene was renewed three times at short intervals. The first matters vomited consisted of the undigested dinner and supper, then there was a greenish yellow and bitter liquid. About three o'clock he again went to bed, and slept till six o'clock, when fresh and abundant vomiting and painful alvine evacuations of a mucilaginous greenish-yellow liquid supervened. The vomiting ceased from that time, but eructations, nausea, and total absence of appetite lasted for four days. Thus, the first day after the experiment, M. Heinrich took nothing but cold water, and the three other days, only a little soup. The abdomen was tympanitic, sensitive, and gurgling. The second day there were two stools, on the third, one, and on the fourth, three, accompanied with griping, and containing, particularly on the second and third day, numerous flocculi, similar to coagulated white of egg. The weakness, already considerable on the first day in consequence of the abundant evacuations, increased at the time of the appearance of febrile phenomena; M. Heinrich was obliged to keep his bed the first day, and could not leave it without difficulty on the three following days. The fever commenced towards the middle of the first day, with shivering, followed by great heat, lasting for several hours, with thirst, very much accelerated pulse, cerebral distress, agitation, and want of sleep. The sensibility of the abdomen disappeared only on the fourth day. The quantity of urine could not be determined, in consequence of the frequency of the stools; this liquid was thick, and had an abundant white deposit.

Colchicine acts like acrid substances in general, and only after being absorbed. The stomach and intestinal canal are the parts on which it especially acts; the brain and the spinal cord remain altogether unaffected, or rather experience only secondarily some vague functional disturbances which are not constant. Death results probably from paralysis of the heart. The blood does not coagulate; it thickens, becomes black and pitchy, such as is found in the most violent cases of cholera; it accumulates in great quantity in the right cavities of the heart, very little in the left auricle. It is not possible to know if the colchicine passes into the blood and urine unchanged, or whether it undergoes modifications.

X. *On the Employment of Guarana in Obstinate Diarrhœa.* (Bulletin Général de Thérapeutique, May 15th, 1857.)

Dr. Hervé, of Lavour, calls the attention of the profession to the employment of a substance which is in common use in South America, and particularly in Brasil, where the cases of diarrhœa and dysentery present themselves in a very severe form. Those who inhabit that country know that every family has a little provision of guarana, and that as soon as any one is seized with diarrhœa or dysentery, a little of the substance is scraped and infused in a cup of boiling water, which is swallowed at once with or without sugar. Dr. Hervé, following the advice of Dr. Mialhe, has given it in infusion in sugared milk, and it is then much more agreeable, and does not lose its special characters. For the last five or six years he has employed this medicine daily; it has never failed him in the most obstinate cases of idiopathic diarrhœa, and almost always it has ameliorated the condition of the patient even in the most serious symptomatic cases. The guarana or *paullinia* has been also employed in the treatment of headaches; and it has succeeded in some cases connected with gastric derangement, but it has failed in others.

The guarana, as a medicine, was first described by Cadet de Gassicourt, in 1817, from a fragment which had been brought to him from Brazil by an officer attached to the French embassy. On this specimen a ticket was fixed, importing that this substance was much employed in Brasil for cases of diarrhœa and dysentery. Towards the close of the year 1822, an inhabitant of the same country, M. Gomès, sent to Mérat a complete specimen; it was a mass presenting the form, colour, and volume of a sausage; there was joined to it a very rough bone, intended to act as a rasp, and which is always sold with the medicine. The learned botanist, Martius, afterwards occupied himself in discovering the plant which yielded the guarana, and he classed the climbing shrub which furnishes the guarana seeds among the Sapindaceæ, under the name of *paullinia sorbilis*, in consequence of its employment as a drink. It may be used in the form of pastiles, syrup, pills, tincture, and pommade, as well as in powder, and in combination with chocolate.

XI. *On the Preparation of Iodide of Calomel (Iodure de Chlorure Mercureux).* By M. Gobley. (Bulletin Général de Thérapeutique, Sept. 15th, 1857.)

The chemical compound called iodide of calomel, discovered in 1847, by M. Boutigny, was prepared by mixing protochloride of mercury and iodine in the relation of one equivalent of iodine and two equivalents of the protochloride, and it consists of a mixture of calomel with biniodide and bichloride of mercury. It is consequently less active than the two latter salts, but more active than the protiodide and the protochloride, and is very much celebrated in the treatment of certain affections of the skin, particularly in acne rosacea. M. Gobley endeavours to render the process of M. Boutigny more practical and more easy of application. He takes iodine reduced to powder in a mortar, and mixes it with calomel, and then introduces the mixture into a small glass retort. This is then placed upon a sand bath, and some moments afterwards the mass is seen to assume at first a greenish tint, and then enter into fusion. The retort is withdrawn, and the mass soon solidifies; it is at first greenish, then in the air it becomes gradually red, and at last it remains so. The iodide of calomel is employed in pills and as a pommade; the former are prepared by mixing it together with gum arabic, crumb of bread, and orange-flower water; the latter is made by mixing it in powder with lard.

M. Bouchardat has lately announced that there are two iodides of calomel—one which may be called a protiodide, and the other a biniodide; and M. Perrens has proposed to prepare the two iodides, differing from one another not only in their physico-chemical character, but also very probably in their therapeutical action. They are prepared in the same manner, except that one compound is formed with half the quantity of calomel which is employed for the other.

XII. *Additional Facts in Support of the Emmenagogue Action of Millefolium.* By Dr. Ronzier-Joly. (Bulletin Général de Thérap., June 30th, 1857.)

Dr. Ronzier-Joly feels convinced that the Achillea millefolium has a decided power in promoting the uterine functions, and records two cases in support of this opinion. In the first case, the patient, who was nineteen years of age, was attacked with a slight sore throat, and in the course of the complaint the menses appeared, but so scantily that only a few drops of blood were passed, and the period ceased the same day. As the sore throat became worse in spite of treatment, it was thought that the appearance of the menses might be attended with a radical cure, and the millefolium was administered. The menses returned in abundance, and lasted two days. In the other case, a woman was delivered of an infant, and was going on well for two days, but on the third she was seized with fever and delirium, and the lochia were suppressed. Sulphate of quinine was administered in the intervals of the fever, and as the lochia did not reappear, in spite of revulsions to the lower limbs, the millefolium was administered as well as the quinine. The lochia reappeared the next morning, and nothing unfavourable afterwards occurred.

XIII. *Notes upon Amylene.* By Dr. Adolf Schauenstein. (Wochenblatt der Gesellschaft. der Aerzte zu Wien, June 22nd, 1857.)

Immediately after the first experiments which were made in Vienna with the new anæsthetic material, amylene, Dr. Schauenstein obtained for examination some of the preparations employed, both of Parisian and Viennese manufacture. They all appeared to be mixtures of solutions having different boiling points, and the greater part of the solutions was volatile at 100°. The most volatile part of the distilled liquid presented a smell resembling chloroform, so that it seemed necessary to examine this pretended amylene for some proportion of chlorine. This experiment is performed in the following manner. The solution to be examined is mixed with about an equal volume of potash or soda ley free from chlorine, and a few drops of solution of nitrate of silver, and then heated with continual stirring up to the boiling point, in which operation the greatest care is taken that too sudden an evaporation does not occur to the solution to be examined. If now so much nitric acid, free from chlorine, is added that the separated oxide of silver again comes into solution, then there remains (in case the fluid examined contains chlorine) the chloride of silver, in its well-known white flocculi, as an insoluble residue. A great number of organic combinations containing chlorine, in which this element cannot be discovered directly by solution of silver, may in this manner be quickly and conveniently tested. The specimens of amylene examined in this manner by Dr. Schauenstein all showed the presence of chlorine. The presumption, therefore, formerly existed that the amylene found in commerce was purposely mixed with chloroform, and it was possible, by referring to this addition, to explain the narcotic operation now and then observed, until there was exhibited an equal, or indeed a greater, proportion of chlorine in a boiling product of distillation prepared according to Balard's direction, than had been formerly found in the commercial article. The necessity now presented itself of obtaining positive conclusions upon the proportion of chlorine existing in amylene. Some amylene was freshly prepared, with especial care that all impurity from chlorine should be excluded. The chloride of zinc employed in the process was treated for several hours at 160°, and after cooling was brought to the test of ammonia, in order to discover by this means the accidental presence of free hydrochloric acid; but it was quite free from this acid. The amylene collected from every part of the product of distillation, which is volatile below the boiling point of water, was left to stand for twenty-four hours, frequently stirring, with some fragments of caustic alkali broken into a coarse powder, and then rectified. Immediately this purified amylene exhibited a large proportion of chlorine.

The investigation of the commercial article had shown that no pure amylene, but only a volatile mixture containing chlorine compounds, had hitherto fallen into the hands of medical men; and the circumstance that even in amylene prepared with so much care such a large proportion of chlorine is discovered, leads to the conclusion that in the method recommended by Balard, by distillation of amyl-alcohol with chloride of zinc, no pure amylene can be obtained. What remains upon the medicinal application of a preparation which shows itself to be a mixture of bodies difficult to separate from one another, and the purity of which cannot be tested, requires no further discussion; and as long as no method is discovered for the preparation of actually pure amylene, and as long as no actual amylene is employed for experiments, all further trials with this body must be wanting in the most necessary foundation of a scientific experiment—namely, sound logic.

XIV. *Observations on Amylene, with Rules for the Administration of Anæsthetic Agents.* By M. A. Espagne. (Bulletin Général de Thérapeutique, Aug. 15th, 1857.)

The author of this paper relates the experience obtained of the use of amylene at the Hospital Saint-Elvi, of Montpellier, where this anæsthetic has been employed with the most satisfactory results. M. Espagne considers that the harmlessness of amylene has been perfectly established; after anæsthesia from this agent, the patients have not experienced any consecutive inconvenience, and they have rapidly recovered their senses. They have been able to eat, provided that the nature of the operation allowed them to do so, and they have never vomited during the administration of the vapours. The writer then tabulates the effects of amylene as follows:—

1. Amylene has, so to speak, no taste. Its strong and sometimes empyreumatic smell is easily borne by the patients, in whom it does not excite such violent nausea as is sometimes produced by the other anæsthetics. It is therefore superior to ether, the first inhalations of which are often painful; and to chloroform, because it is more easily tolerated.

2. As to its mode of administration, ether is inferior to chloroform and amylene, for the first requires the employment of a peculiar apparatus, while the two others may be inhaled by the assistance of the most simple means.

3. In rapidity of action, the experiments at Montpellier give the priority to chloroform; those of Paris give it to amylene: M. Espagne gives to amylene and chloroform an action almost equally rapid.

4. As to the nature of the effects produced, the qualities of ether, chloroform, and amylene are very different. Amylene produces only a scarcely sensible excitement, which is often even absent. The patient breathes freely, without coughing, without those chronic convulsions which accompany the first inhalations of ether; nor is there the secondary comatose depression, the heavy and prolonged intoxication which follows the administration of chloroform, nor that more gay and expansive intoxication which is consecutive to the inhalations of ether. The recovery is sudden, and if the amylenation is not continuous, the consciousness reappears. But these advantages are counterbalanced by a rather serious inconvenience. The effects of amylene are not only transient, but they are insufficient for operations which require complete muscular relaxation. Patients, therefore, who suffer from old dislocations are not proper subjects for amylene.

5. As to the duration of the anæsthesia, amylene has not a consecutive effect. Ether, on the contrary, and especially chloroform, continue their action after the inhalations are interrupted. With the latter, indeed, the greatest intensity in the effects is realized only some moments after its administration.

To discover an anæsthetic substance free from danger altogether, is a chimera which it is not necessary to entertain. Anæsthesia is always dangerous, as M. Tourdes truly remarks, whatever may be the substance employed.

Dr. Espagne concludes his paper by remarking that when administered with suitable precautions, amylene is capable of rendering important services to operative surgery; and he does not hesitate to believe in its anæsthetic power and efficacy, but that more numerous experiments and observations are necessary in order to fix the rank which it ought to hold among other anæsthetic substances.

[In a note by the editor of the 'Bulletin Général,' it is stated that the above article was written before the occurrence of another case of death from amylene in the practice of Dr. Snow.]

QUARTERLY REPORT ON PATHOLOGY AND MEDICINE.

By Edward H. Sieveking, M.D.

Fellow of the Royal College of Physicians, Physician to, and Lecturer on Materia Medica at, St. Mary's Hospital.

I. *On Alternating Hemiplegia.* By Dr. Gubler. (L'Union Médicale, September 29th, 1857.)

The term alternating hemiplegia is applied by the author to that variety of hemiplegia in which the paralysis of the face is on the side opposite to that of the paralysed extremities. The lesion to which Dr. Gubler attributes the peculiarity of this form of paralysis, is the disease of the pons Varolii; he gives several instances, of which we quote the following:—

A female, aged forty-four, was admitted into the Hospital Beaujon, on August 27th, 1856. She was in the last stage of phthisis; the right extremities were paralysed, and had been so for a considerable period; those on the left side preserved their integrity. The face showed a deviation of the right labial commissure outwards and upwards, which a careful examination proved to be due to actual paralysis of the left side of the face. The left eye could only be half closed: the corresponding cheek was flabby, and distended in expiration; there was no physiognomical expression except on the right side; when in pain, the patient only showed it on this side, the opposite one remaining perfectly immovable. The intelligence was diminished, as well as the general vigour of the patient, but the former exhibited no other derangement. The memory was good, and articulation clear. Death ensued three weeks after admission. Autopsy thirty hours after death:—Slight thickening of the arachnoid; the cerebral hemisphere healthy, with the exception of a single point to the left, near the pons Varolii. The central parts, including the fornix, septum lucidum, and commissures, were softened, pultaceous, without change of colour. The pons exhibited at its exterior half a reddish spot, somewhat depressed, resembling a cicatrix, from fourteen to fifteen millimeters in diameter, and to the left of the meridian line. A longitudinal incision, passing through the middle of the pons, divided this spot into two unequal parts, traversing a hard mass of the size of a filbert, and set in the tissue of the pons. The nerve-tissue surrounding the tumour was softened, here and there almost diffluent, and the softening penetrated much further to the left of the pons than on the opposite side. The nervus trigeminus of the left side was pink and softened, its nerve fibres indistinct, and its fibrous envelope very vascular. The facial nerve of the same side was scarcely altered.

The following are some of the general conclusions with regard to the feature in question, to which M. Gubler draws attention:—1. Cerebral hemiplegia, properly so called, is always unilateral. 2. In the rare case of alternating hemiplegia, the pons Varolii is the seat of injury. 3. The lesion always exists exclusively or chiefly at the side opposite to the paralysis of the limbs, and on the same side as that of the face. 4. The deranged sensibility and motility of the face may exist as well if the pons alone is affected, as if the trunks of the nerves themselves are involved; consequently, alternating hemiplegia must be regarded as a sign of lesion of the pons Varolii. 5. It is manifest that the facial nerves undergo a complete decussation, and that if the injury be anterior to it the paralysis will be on the same side; if posterior, on the opposite side. 6. Injury of the pons induces complete paralysis of the corresponding side of the face.

II. *Clinical Observations on Epilepsy.* By Dr. Th. Herpin. (L'Union Médicale, No. 121, 1857.)

Dr. Herpin's name is familiar to the medical profession on account of his urgent advocacy of the employment of oxide of zinc in the treatment of epilepsy. He now abandons this preparation entirely in favour of the lactate of zinc. The greater solubility and digestibility of the latter would *à priori* engage our sympathies in its favour. The following is one of the cases which have decided the author's preference, and deserves to be recorded on account of the success obtained in spite of the unfavourable prognosis which the case would have justified in the first instance.

Miss E., aged eleven and a half, consulted Dr. Herpin, February 1st, 1854. She was well made, intelligent, and pleasing. Her paternal grandfather had died epileptic at forty-nine years of age; her maternal grandfather at seventy-six, after being insane for six years, and in a state of melancholy for forty years. No predisposing or exciting cause was traceable in the patient, excepting perhaps the fright caused by a fire two months previous to the first attack. She enjoyed excellent health till six years of age, when she had typhoid fever, having on the right side a tendency to slight and evanescent deafness. Three months before the first seizure she was attacked with frequent headache, generally commencing in the morning, and lasting till evening. The headache ceased in December, 1853. The first fit occurred on August 15th, 1853, the second on September 5th, the third on September 26th; six then followed at variable intervals, making altogether nine in less than five months; they always took place during the first hour of sleep, and the evening before the attack she was observed to be somewhat excited. The symptoms, which are detailed, leave no doubt as to the attacks having been those of genuine epilepsy. The oxide of zinc had been prescribed for the patient from September to the following July, but she was unable to bear the doses which Dr. Herpin thinks necessary in order to make a proper impression upon the patient. He was once able to reach a dose of six grammes (ninety grains) per week, but he was obliged to diminish it. Still the attacks ceased, from January the 8th to July the 18th; but a return on that day, brought on by a tepid bath, induced M. Herpin to have recourse to the lactate of zinc, which he gave for above six months, during which time the patient swallowed 306 grammes (4600 grains). The tolerance of the remedy was complete, and when she left off taking it, she was in perfect health. There was one recurrence of epilepsy two months after commencing the lactate. Three years have since elapsed, and the lady's health continues sound.

III. *Facial Neuralgia cured by Division of the Little Nerve passing from the Superior Alveolar Nerve to the Mucous Membrane of the Mouth.* By Professor Schuh. (Wochenblatt der Zeitschr. der Gesellsch. d. Aerzte. No. 20, 1857.)

Marcus Weiss, aged fifty-five, miller, had always enjoyed good health till attacked by ague seven years ago; this continued for six weeks, and soon after a continuous pain affected the right side of the face, between the angle of the mouth and the masseter, which from time to time became more severe. These paroxysms were accompanied by slight twitching of the muscles on the corresponding side of the face; they would recur frequently on the same day, but often intermitted for several days. Change of temperature, chewing, and talking, exercised no influence on the production of the attacks. After the pain had lasted two years, the patient had two teeth of the right upper jaw extracted on account of severe toothache; the remaining teeth fell out. He used leeches and blisters to no purpose, and remained in the same condition for five years. During the ensuing two years the paroxysms became more frequent; mastication now induced severe pain; he underwent a variety of treatment in Vienna without marked benefit. For a year before coming under Dr. Schuh's treatment he suffered even at night, and sleep could not be secured by opium.

When seen on the 26th February, 1857, he was spare, but otherwise healthy-looking, prepared to submit to any kind of treatment that might be suggested. No change of colour or temperature was observed in the face during the seizures; there was no lachrymation, no rigidity of any kind; but there was slight perspiration at the time of the attack in the face. The permanent pain was described as residing at the inner side of the cheek, from where it radiated towards the ear during the paroxysms; less frequently towards the eye, and never towards the nose and upper lip. Neither gentle nor rough friction, pressure, pinching, nor talking, had any influence upon the attacks. The patient bore pressure upon the point of exit of the infraorbital nerve without pain. Dr. Schuh observed him during nearly three weeks before undertaking any operative proceeding, and satisfied himself of the futility of employing medicines. He was of opinion that the pain resided in the twig which passed from the superior maxillary nerve through the buccinator to supply the adjoining mucous membrane of the mouth. As it was manifestly impossible to isolate this nerve, Dr. Schuh divided the soft tissues from the angle of the mouth to the masseter; and having separated the mucous membrane from the areolar process of the superior maxilla, scraped off the muscular attachments of the buccinator from the spheno-maxillary fossa. Dr. Schuh made several parallel incisions in a slanting direction, so as to insure destruction of a portion of the nerve. No material hæmorrhage occurred while the operator's finger occupied the spheno-maxillary fossa as a director for the instrument; but on its removal a considerable amount of blood was lost. From the time of the operation all pain ceased, and the patient, with the exception of an intercurrent attack of epidemic tonsillitis, recovered satisfactorily. He quitted the hospital before the wound was entirely healed, as the exfoliation of a small lamina of the upper maxilla was not completed.

IV. *On Transposition of the Ventricles of the Heart in the New-born Child.*

(L'Union Médicale, November 10th, 1857.)

The following two cases occurred to Professor Stoltz, we presume, of Strasburg. The first, a well-developed male child, gave signs of life when born, and weighed 3,050 grammes, or about ninety-five ounces. Soon after its birth it became pale, then cyanosed, remained dull, and refused the breast. Five days later death ensued. The right auricle, as usual, received the venæ cavæ and coronary veins; the foramen Botalli (qu. foramen ovale?) was closed by a well-developed but inadherent valve. The right ventricle was provided with a *mitral* valve, and the aorta arose from this ventricle. The left auricle received the pulmonary veins; but the left ventricle, which was provided with a *tricuspid* valve, drove the blood into the pulmonary artery; so that there would have been two closed circuits perfectly independent of one another, but for the partial opening of the foramen ovale, and for a communicating channel which passed from the pulmonary artery close to its origin, to the aorta.

In the second case, death did not take place till thirty-seven days after birth. The child presented no appearance of any irregularity during the first ten days, but was robust and active. At this period it was observed that the child became suddenly blue and almost asphyxiated; he was rubbed and warmed, and then recovered himself, and again took the breast. Things went on in this way to the thirty-fifth day; the cyanosis then lasted much longer; the child became dull and weak, and died. The body was bluish; the jugulars, especially the right, were enormously distended; the same was the case with the subclavian and vena cava superior. The heart measured seventy-five millimetres (2·9 inches) from the base to the apex, and fifty-eight millimetres (2·2 inches) at the base in width. Emptied and deprived of the pericardium, it weighed fifty-six grammes (above fourteen drachms), or about twice the normal weight. The *right* auricle was much distended; the foramen Botalli (foramen ovale) was provided with a complete valve, though free at its anterior edge. The ventricles were hard and firm; the thickness of the parietes was considerable; the *right* ventricle was smaller than the *left*, and empty, while the latter contained black clots of blood. The aorta was given off by the right ventricle, the pulmonary artery by the *left* ventricle. The pulmonary artery was so distended as to resemble an aneurismal sac, terminating suddenly in three branches—the communicating branch, and the two pulmonary divisions. The mitral valve was on the right, the tricuspid on the left side.

V. *On Three Cases of Hydropneumothorax treated by Paracentesis Thoracis and Injections of Iodine.* (L'Union Médicale, Oct. 31st and Nov. 10th, 1857.)

The three cases which are detailed in the above-mentioned articles occurred in the Hôtel Dieu, under Professeur Trousseau; one proved fatal, the other two have had a successful issue. In the former, however, death did not ensue till six weeks after the operation; the disease for which it was performed having been complicated with phthisis, which was not positively diagnosed during life, it would not be just to impute the fatal result to the operation.

The most completely successful of the three cases was the second, of which the following is an outline: A man was admitted into the hospital, November 12th, 1856, six weeks after having suffered serious injury by being squeezed between two carts. He was still in great pain, the right side of the thorax presented a considerable elevation; there was dulness posteriorly as far as the spine of the scapula, and the respiratory murmur was inaudible at the base of the chest; in the infra-spinous fossa there was a blowing sound, egophony, metallic tinkling, and hippocratic succussion caused a splashing which was audible at a small distance from the thorax. In the subclavicular space the percussion sound was abnormally clear. The abdominal organs were forced downwards, the liver projecting considerably below the false ribs. There was frequent cough, with expectoration, which was at times bloody and rusty, at others frothy and colourless; respiration was quick and painful, the pulse small, about 120. The patient's strength was good. M. Trousseau diagnosed hydropneumothorax, and on introducing a trocar between the seventh and eighth intercostal space, 5¼ litres (nearly twelve pints) of an odourless purulent fluid were evacuated; and having entirely emptied the pleura, 258 grammes of an iodized solution were injected, which was partly removed after a few minutes, and the wound shut up. No inconvenient symptom followed; the wound healed up in the course of eight weeks, during which it continued to discharge a purulent serosity. The chest by this time had collapsed on the right side; the vesicular murmur was everywhere restored, but feeble, and mixed with mucous rales in some points posteriorly; in front it was pure and audible, even on the level of the puncture. The patient left towards the end of January, and soon after was well enough to return to his employment as carman.

The third case occurred in a man, aged thirty-five years, as the result of pleurisy of the left side. The operation was performed as in the last case, followed by iodised injections,* repeated no less than twenty-four times at different intervals. The patient did well; the left side of the chest fell in, and the percussion sound of the part affected was restored almost to the normal condition; but five months after the operation the orifice made by the trocar still continued to discharge a small quantity of pus, and it was feared that there was tubercular deposit in the lung, to combat which the hypophosphite of lime was prescribed according to the formula of M. Churchill.

In the remarks that conclude the articles, the propriety of performing the operation is dwelt upon, and the iodized injections are spoken of as the only remedy by which we may hope to obtain a cure of purulent effusions, and of hydropneumothorax even, without serious danger.

VI. *A Case of Capillary Embolia.* By OTTO BECKMANN. (Archiv für Pathol. Anat. u. Physiol., Band xii. Heft 1.)

George Mai, a butcher-lad, aged twenty, previously in good health, was seized suddenly on the night of May 1st with rigors and pain, and with slight swelling in the right knee. He was admitted into the Würzburg Hospital on the following day. The swelling subsided on the 3rd, but in the ensuing night violent delirium occurred, which persisted, and on account of the violent fever, heat of skin, dry furred tongue, petechiæ over the whole body, and general expression, his affection was regarded as petechial typhus. Death ensued on the 6th.

Autopsy, forty hours after Death.—From the account, which is given in great detail, we can only extract the more prominent points. Extravasations were found, varying in size, throughout the body, both on the surface and in the viscera. A few ounces of bloody fluid were in the pericardium, numerous ecchymoses on the surface of the heart, left ventricle contracted, both sides of the heart containing coagula. The tendons of the mitral valve were much thickened; on the auricular surface of each curtain was an irregular thickening, upon which lay soft masses, which were easily detached, and the removal of which showed an eroded dirty-white spot, with elevated reddish-white edges. The masses consisted of amorphous granules, which were not materially altered by the various reagents. Vertical or flat sections through the part exhibited the same substance aggregated near the surface; lower down it was divided by a delicate framework, and gradually became both paler and more widely separated, being arranged in fusiform patches, varying in size. An enlargement containing similar opaque matter was found in the right curtain of the tricuspid. The semilunar valves were healthy, and the endocardium throughout unchanged; minute ecchymoses, often containing a paler centre and some small white spots, shone through the endocardium; the muscular tissue was firm, and marbled. On examining carefully the white spots, they were found to be surrounded by normal muscular fibres; capillaries were seen uniformly to radiate from an oval or circular centre, and these capillaries were filled with the same granular matter which existed in the mitral valve. Wherever the capillaries showed these contents, they were distended. Some spots consisted entirely of an accumulation of small shining cells resembling shrivelled blood corpuscles. The centre above-mentioned, from which the capillaries radiated, consisted of colourless blood corpuscles, often studded with oil, and supported by a firm fibrous mass, which became homogeneous in acetic acid. Some parts of the heart exhibited fatty degeneration of the muscular fibre. In the kidneys numerous ecchymosed spots were found, which displayed the same microscopic appearances as those described as being displayed in the heart. Numerous ecchymoses of greater or less size were met with in the pia mater and different parts of the brain. The disposition was similar to that seen in the heart; there was a pale centre, consisting of fibrin and colourless blood-corpuscles, surrounded by no blood. In the brain itself there was broken-up cerebral tissue as well. The author was unable anywhere to discover immigrated plugs, but both in capillaries as in small arteries, he repeatedly found the same granular matter met with in the mitral valve.

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* Fifty grammes of tincture of iodine, five grammes of iodide of potassium, with one hundred to one hundred and twenty grammes of water.

In the commentary appended to the case, Dr. Beckmann expresses himself confidently upon the fact, that the various extravasations, the minute dots in the heart, the larger hæmorrhagic spots in the brain, as well as the ecchymoses in the kidneys, were all due to detachment of the substance contained in the mitral valve; and that, as proved by direct observation, this gave rise to capillary obstruction or embolia. The resulting hæmorrhage is attributed to the disruption of the vessels caused by the force with which the granular matter was propelled into them; this seemed the more probable, as in some of the emboli contained in the heart, an effusion of this granular substance was found unaccompanied by hæmorrhage. The author further concludes that the diagnosis of typhus was incorrect, and that the affection was in reality endocarditis; but that at the commencement of the acute symptoms the muscular tissue of the heart had already undergone such changes as to have materially affected the power of the organ; in consequence of this the arterial pressure was diminished, and that of the venous system increased; as a further consequence, material changes took place in the capillary circulation, which were increased by the detachment of small masses of the valvular curtains, giving rise in their turn to obstruction at certain points of the capillary network. These conditions necessarily served materially to aggravate one another, the engorgement of the venous system advanced, the number of pellets of granular matter projected into the vital organs increased, until at last the introduction of some larger masses into the arteria fossæ Sylvii caused a more extensive hæmorrhage and death.

VII. *On the various Tests for Saccharine Urine, and on the Varieties of Diabetes.* By Dr. A. Becquerel. (L'Union Médicale, No. 98, 1857).

Dr. Becquerel draws attention to certain fallacies that may arise in the employment of the potassio-cupric liquid of Barreswil, the solution of Frommerz, or caustic potash, as tests for sugar in the urine. The following method, he states, prevents all fallacy:—To a measured quantity of urine—say thirty parts, add a similar quantity of solid acetate of lead in crystals—say two parts; heat being applied, a dirty-white precipitate is at once obtained; this liquid is to be filtered, and the filtrate treated with sulphate of soda in excess—say four parts. The second mixture is to be again heated; the sulphate of lead is precipitated, and a clear, transparent liquid remains, which contains the sugar, if any was present, the urea, and some saline matter. The potassio-cupric solution is not reduced, nor liquor potassæ turned brown, unless sugar is present in this liquid. If albumen is present in the urine, the acetate of lead carries it down with the other organic matter contained.

After various remarks on the purely chemical aspects of the question, Dr. Becquerel passes to the consideration of diabetes; which he regards either as idiopathic or symptomatic. The former is characterized by the presence of a notable amount of sugar in the urine, which is increased in quantity; there is excessive thirst and hunger, with other morbid phenomena. In the latter, the presence of some sugar in the urine is an accessory symptom, following upon other diseased conditions; like albuminuria, it is associated with a great variety of diseases. In these cases the sugar is never very considerable, though it may amount to as much as 25 or 26 per 1000; while in idiopathic diabetes it rises to 60 and even 80 per 1000. In symptomatic diabetes neither the quantity nor the density of the urine is materially increased.

Dr. Becquerel divides the conditions with which symptomatic diabetes may be associated into five categories:—1. Diseases of the brain and cord. 2. Diseases of the liver. 3. Diseases accompanied by dyspnœa. 4. The presence of lactation. 5. Various diseases.

Among nearly two thousand patients, whose urine the author has caused to be examined at the Hôpital de la Pitié, he has found five cases belonging to the first category; they were respectively,—1. A case of myelitis in a woman, aged thirty-seven, who died tetanic, and had sugar constantly in her urine. 2. A case of general paralysis in a woman, aged fifty-four, with temporary convulsive affections, during which the urine was saccharine. 3. Amaurotic amblyopia, with a paralytic condition of the lower extremities, in a man, aged fifty-one; urine permanently saccharine. 4. A man, aged sixty-two, closely resembling the last case. 5. A young woman, aged twenty-two, with meningo-cephalitis, during which there were 8 to 12 grammes of sugar per 1000 in the urine. Recovery: five weeks later, return of the same symptoms, when there was no sugar or albumen in the urine. Death ensued, and the diagnosis was confirmed by the autopsy.

Dr. Becquerel reports three cases of liver disease accompanied by diabetes. 1. A man, aged fifty-three, with chronic gastritis and chronic hepatic congestions, had 20 to 28 grammes of sugar per 1000. 2. A man, aged fifty-four, with pulmonary emphysema, and consecutive chronic congestion of the liver; the sugar was detected for six months, and then disappeared. 3. A young man, aged nineteen, with slight enteritis and blennorrhagia (there is no further statement about hepatic disease): being a sugar-refiner, he consumed nearly a kilogramme of sugar (about 1¼ lb.) daily. Sugar was found in his urine during the whole time of his stay in the hospital.

Dr. Becquerel expected to find sugar frequently in diseases accompanied by embarrassed breathing, but failed to do so entirely.

He found sugar in the urine of each of nine women recently delivered, in whom the lacteal secretion was established. It was also met with in the two following cases, which do not come under any of the preceding heads:—

1. Female, aged thirty-five, affected with cancer of the neck of the womb, not ulcerated. 2. A man, aged fifty-four, affected with extreme anæmia, the result of poverty.

VIII. *Observations on Diabetes Mellitus, especially with regard to the Changes of Temperature occurring in this Disease.* By Dr. Lomnitz. (Henle und Pfeuffer's Zeitschrift. Dritte Reihe, Band II. Heft 1.)

On twenty-one successive days, 24th October to 13th November, 1856, Dr. Lomnitz carefully examined the temperature of three diabetic patients in the hospital at Göttingen, by introducing the bulb of a thermometer into the arm-pit and into the mouth. The observations were taken morning and evening, and each time the frequency of the pulse and respiration, as well as the amount of urine passed in twenty-four hours, and its specific gravity, were noted. Two of the patients were females, and respectively thirty and thirty-six years of age; the third, a young man, was nineteen years old. On comparing the average of his results with the temperature of healthy individuals as determined by Bärensprung, he finds that the diabetic patients suffered an average reduction of 1·07° Réaumur (2·4° Fahrenheit) in the arm-pit, and of 0·39° Réaumur (0·8° Fahrenheit) in the mouth. The author sums up his observations thus:—1. The temperature of a person suffering from diabetes mellitus is lower than that of a healthy individual. 2. The diminution of temperature is not progressive, but persists at a definite point, acquired at a stage of the disease which has not yet been determined. 3. There is no relation between the loss of temperature and the alterations in the pulse.

IX. *Remarkable Case of Gangrene of a Portion of Intestine.* By Dr. FUCKEL, Assistant-Physician to the Hospital at Fulda. (Vierteljahrschrift für die Praktische Heilkunde, xiv. Jahrg., 1855, Band iv.)

The following are the chief points of this interesting case:—K. C., a widow, aged forty-eight, the mother of nine children, had always enjoyed undisturbed health, when, on July 1st, 1856, while engaged in garden work and stooping down, she suddenly felt intense pain shooting from the renal to the hypogastric region. She was compelled to go to bed. She had much tenesmus, nausea, retching and vomiting, and there were continued borborygmi. Repeated and profuse vomiting ensued—at first of food, subsequently of pure bile. Frequent painless diarrhœa, at first fæculent, afterwards muco-sanguineous, occurred on the first day. The paroxysms of abdominal pain recurred, and during the intervals there was a dull pain throughout the whole abdomen. There was little fever, no headache, no appetite, but unquenchable thirst. On the second day of the illness the catamenia appeared, and ran their normal course. No improvement took place, and on the 12th July she was admitted into the Fulda Hospital. At her admission the symptoms were such as detailed above; the pulse eighty-four, the tongue covered with a dirty yellow fur, the breath foul; the abdomen hard, but not tympanitic. Pressure induced intense pain, radiating from the kidneys, otherwise nothing was elicited by the examination. There was no trace of hernia. Immediately after admission the patient commenced vomiting a bilious fluid, amounting daily to from four to six pounds; the alvine evacuations also amounted daily to ten or twelve pounds. Much urine was passed, not containing albumen. The patient rapidly emaciated, as she refused all food; the pain diminished, and she complained more of the intense thirst. All fever disappeared, and the temperature of the skin sunk below the normal elevation. On the 3rd August an indistinct, deep-seated, almost painless, sausage-formed tumour, was felt along the edge of the left os ilii. It appeared to be from two and a half to three inches in diameter, and four inches long. On the 5th August a second, more irregular and tuberculated swelling, about three inches in diameter, was detected under the navel. Some of the elevations of the tumour could be pushed aside by the fingers, and the proceeding was accompanied by loud gurgling. On the 6th August the tumour of the left side had disappeared, and a sausage-formed tumour was felt horizontally below the navel. The diarrhœa now diminished, and the abdomen became less tender. On the seventh day she passed a hard and large mass per anum, after which the pains, which had previously been much increased, abated considerably.

The mass proved to be a portion of intestine, about 4" long. Only about two-thirds of the tube were present; the lower portion showed a bend. The edges of the intestine were partly gangrenous; the parietes consisted of a double layer, resulting from an adhesion of the serous surfaces of the small and large intestines. Both surfaces of the portion were covered with mucous membrane; the lower one proved to belong to the colon, and was in a state of chronic catarrh; the other exhibited the appearances seen at the upper portion of the ilium. The two serous membranes could be separated with difficulty.

Two perforations were found at the bend of the knuckle. There was no trace of omentum.

The vomiting ceased, the diarrhœa diminished, and the patient gradually improved; a tumour remained in the abdomen, between the navel and the left os pubis, concerning which no further particulars could be obtained. On the 4th September, 1856, the patient was discharged in a state of comparative health. The diarrhœa still occurred at times; the fæces contained undigested food.

In the remarks upon this interesting case, Dr. Fuckel dwells upon the obscurity of the case previous to the discharge of the portion of intestine. He is of opinion that an adhesion had existed between the two serous coverings of the different portions of intestine, long before the last disease commenced, occurring probably during a confinement. He assumes that at the time of the first symptoms a knuckle of small intestine was pushed into the colon, so that on further adhesion inflammation taking place, and the strangulated portion becoming necrosed, the latter fell into the colon, and was evacuated. The author gives diagrams to illustrate his explanations, which we are unable to reproduce, but without them, it would be useless to enter more into detail.

QUARTERLY REPORT ON SURGERY.

By John Chatto, Esq., M.R.C.S.E., London.

I. *On the Cure and Relapse of Syphilis.* By Professor Sigmund. (Wien Wochenschrift, 1857. Nos. 14, 19, 22, and 28.)

Continuing the communications upon syphilis that we have already noticed,* Professor Sigmund next arrives at the question of permanent cure and relapse. Upon this subject he observes, the most various and contradictory opinions prevail, and he wishes to bring to bear upon it the information he has derived from his large experience in this class of diseases. By the cicatrization of a primary sore, syphilis is not necessarily to be considered as cured, except in the few cases in which caustics have been promptly and effectually applied. If, however, the patient has been subsequently carefully watched for a period of not less than three months, without his exhibiting any induration at the seat of the chancre, any enlargement of the glands, or affection of the skin or mucous membrane, he may be pronounced as durably cured. Multiplied observation enables the author now to lay this down as an indubitable position. If contrary opinions are held, these have arisen either from the practitioner overlooking the early appearances of secondary disease, and only dating from the period when this has become plainly obvious, or from his not attaching sufficient weight to certain symptoms which yet, without doubt, announce the advent of secondary syphilis. These have been stated in the author's former papers, and it is here only requisite to refer to the induration of the base and edges of the site of the chancre, the hard and knobby enlargement of the lymphatics, implicating at last those distantly placed, as in the neck or axilla, &c. The cases in which secondary symptoms are said to break out years after healing of the primary, without any intervening affection of the glands, skin, or mucous membrane, must be placed in the category of inexact or imperfect observations. So, too, the opinion that secondary symptoms only very rarely follow non-indurated chancre, is due to faulty observation; for while, on the one hand, simple ulcers, eczema, pustules, or abrasions have been confounded under the name of chancre; so, on the other, a period elapses (usually amounting to twelve days, but sometimes much longer) before indurated chancre itself exhibits the characteristic hardness. We are never justified in assuring a patient that a non-indurated sore will not be followed by secondary disease.

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* Vol. xix. pp. 266 and 544.

The determination that secondary syphilis is cured, is a more difficult matter. The extremest of opinions prevail; and while the majority are content with the disappearance of the most striking symptoms, others require the disappearance of every symptom of disease, even when this may not apparently depend upon syphilis, and may indeed be irremovable. A patient may be said to be cured when appearances essentially dependent on syphilis having disappeared, do not within a certain period return again, although the individual has returned to his mode of life. This statement resolves itself into two points:—

1. The *disappearance of all symptoms essentially dependent upon syphilis.* This applies to appearances that are really removable, which is not the case with some—as the cicatrices of ulcers, spots left by pustules, strongly injected papillæ, bony deposition, loss of substance, &c. In young robust individuals, in the more rapid forms of the disease, and in the absence of general organic disturbance, recovery may in some cases be so complete that all the organs and functions are left in as perfect a state as prior to the attack. In such cases relapse is rare. But a series of symptoms may be induced by syphilis, and must therefore be considered as essentially symptomatic of it, although in other individuals the same diseased actions may be excited by non-syphilitic causes, and it is here often difficult to decide whether the patient became the subject of these prior to or during the attack of syphilis. Among these are a pale, dry, withered, chapped skin, general emaciation; anæmia, enlarged lymphatics, chronic catarrh of the mucous membranes, so-called rheumatic pains, inflammatory action in the bones and cartilages, &c. Without an exact knowledge of the patient's previous condition, it may be impossible in some of these cases to decide whether the essentially syphilitic symptoms have disappeared.

2. The *subsequent observation of the individual* over a period of time which varies in different cases. The duration of this must be determined by the degree, extent, and duration of the disease, the nature and effects of treatment, the bodily condition of the patient, and the influences to which he is exposed. In even recent, simple, and slight secondary disease, the author never, when possible, employs in the after surveillance less than a third of the time occupied in the treatment—therefore, three or four or even five weeks. From this may be deduced the time required in old, complicated, and bad cases, for which years of observation may be necessary.

Prof. Sigmund criticises certain popular tests of the completeness of the cure current in Germany, such as the ready healing of simple wounds and ulcers, the induction during treatment of critical sweating and salivation. In respect to this last, though never desiring to produce salivation, he protests against the modern idea that mercury should only be continued until a moderate amount of this is induced, even though the symptoms do not yield. The procreation of a healthy child by a person who had suffered from syphilis, has also been too readily received as a test of the completeness of cure. Although signs of syphilis are frequently very obvious at an early period of the life of an infected child, there are others the syphilitic nature of which it is often difficult or impossible to determine, such as anæmia, atrophy, scrofula, doubtful eruptions, as pemphigus, ulceration, &c.; distincter forms of the disease only exhibiting themselves at a much later period. Again, in certain cases of undoubted syphilis in the parent (usually the male) at the period of procreation, no form of the disease has been conveyed to the child.

By the term *relapse* is to be understood either the reappearance of former symptoms, or the further development of new ones after apparent cure. It is met with under every form of treatment, and some practitioners regard it of such common occurrence as to lay down the rule that syphilis under cure must go through a course of such reappearances, while others on this account pronounce the disease as absolutely incurable. An ample field of observation prevents the author from agreeing with either of these statements, and has taught him that, while in the great majority of cases no relapse takes place, there are certain circumstances under which it is more liable to occur; viz., 1. In scrofulous and tuberculous individuals, as also in anæmia, and all conditions related thereto, as ague, cachexia, debility from loss of vital fluids, scorbutus, &c. 2. In the very young, and especially in the very old. 3. In cold, damp, sunless periods of the year, and after the too sudden passage from dry, warm, sunny places to those of an opposite character. 4. In great and continued neglect of simple dietetic rules and of personal cleanliness. 5. In secondary syphilis of the mucous membranes, the bony and cartilaginous textures. 6. When treatment has been interrupted, incomplete, or conducted too precipitately. 7. When mercurial treatment has not been employed. Upon the last point Prof. Sigmund descants at great length, declaring that under properly-conducted mercurial treatment relapse occurs infinitely less frequently than under any other. Of all the forms of the medicine he prefers the ointment.* He makes some severe comments upon the carelessness and ignorance of those who have recommended various substitutes on very insufficient grounds.

II. *On Congelations.* By M. Valette. (Recueil de Mémoires de Médecine et de Chirurgie Militaires. Tom. xix., pp. 259.)

M. Valette having had abundant opportunity during the late war of studying this subject upon crowds of French soldiers in the hospitals at Constantinople, suffering from congelation of the hands and feet, has contributed an interesting paper respecting it to the valuable Journal of Military Medicine published by the French Army Medical Department. The following are his principal conclusions:—

1. A moderate degree of cold is sufficient to give rise to the more or less serious effects of local congelation, when it is aided by numerous causes of general debility. 2. These effects may be divided into five different degrees. I. The sensibility and motility of the parts are chiefly affected; but the effects are usually dissipated within twenty days. II. The formation of phlyctænæ. III. Ulceration of the superficial layers of the dermis. IV. Mortification of the skin and subjacent cellular tissue. V. Sphacelus of a more or less considerable portion of a limb. 3. This last form sometimes affects the whole of both feet simultaneously, coming on insidiously with the symptoms of the first degree. A brownish depression suddenly encircling the lower end of each leg, opposite the base of the malleoli, is the sign of its invasion. 4. The fourth and fifth degrees have never been observed as the result of a too sudden return of the circulation and warmth in the parts affected, the gangrene always supervening upon the gradual extinction of vitality unattended by any local reaction. 5. The progress of these congelations was rendered remarkable by the slowness with which the functions of the parts became re-established in the two first degrees; and the great delay attending the process of cicatrization in the three last. 6. The chief fatal internal complications were diarrhœa, tetanus, and typhus. 7. Independently of complications, the congelations never gave rise to the phenomena of general reaction; but in some patients, on the elimination of an important part—e.g., both feet—the febrile action took on the form of quotidian intermittent. 8. It was not in general possible to determine

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* For an account of Dr. Sigmund's mode of employing this, see Medical Times, vol. xxxv. p. 443.

during the first days with what degree of congelation the part was smitten. 9. In all cases prognosis should be very reserved. Still, setting internal complications aside, it may be said to be favourable in the first three degrees, and unfavourable in the last two. It is more favourable when the hands than when the feet are affected, and it is highly unfavourable when diarrhœa of more than two months' date, pseudo-membranous bronchitis, adynamic pneumonia, dropsy, or tetanus is present. 10. The prophylaxis should consist in the frequent change of tents, the addition of preserved vegetables to the rations, the frequent distribution of small quantities of alcoholic drinks, and in the anointing the feet with some fatty body, as tallow, that may be spread into a thick layer. 11. General treatment exerts great influence on the progress of local congelations, and should be directed in regard to the prevailing anæmia and debility. 12. The local treatment of the first degree should consist in the application of lotions containing laudanum, conjoining with these, if œdema is present, frictions, with tincture of digitalis and camphorated spirits. The parts should afterwards be carefully wrapped in flannel or wadding. In the second degree, the epidermis should be carefully preserved after evacuating the serosity. In the third degree, the pain and itching of the ulcers should be allayed by fermentation with infusion of elder containing laudanum and extract of lead, while the process of cicatrization should be hastened by caustics. In the fourth degree the danger did not consist in too active local reaction, as observed in men in the full plenitude of vital power at the time of congelation, but in a gradual, insensible extinction of life in the parts affected. Stimulant frictions are at once indicated, and if eschars still form, they should be removed as soon as possible, by carrying the knife along the limit separating the dead from the living parts. In the fifth degree, elimination should be encouraged by stimulating fomentations; and when the ulcerative furrow has sufficiently separated the dead from the living parts, any ligaments, tendons, or bones which impede complete separation, should be divided level with the living parts—an operation perfectly harmless, and much abridging the progress of the case. [The harmlessness and propriety of this interference, we may observe, is denied by M. Baudens and other Crimean observers.] 13. It results from the observations made in Africa, and the experience gained in the Crimea, that, as a general rule, amputations should be abstained from in cases of congelation, leaving these to the reparative powers of nature, at the same time aiding by general and local means the elimination of the dead parts. To this general rule, however, the following cases are exceptions:—I. When trismus occurs in a subject too debilitated to admit of bloodletting, the patient will die in twenty-four or thirty-six hours unless amputation is speedily performed. II. When a congelation of the fourth degree is complicated by diarrhœa, which resists treatment, amputation must be performed, in order to render the economy susceptible of the influence of therapeutical agents. III. When sphacelus of both feet is announced by the appearance of the brownish circle at the lower extremity of each leg, amputation must be performed, or the patient will sink under an exhausting diarrhœa. When internal complications do not prevent it, the interval of a week may elapse between the two operations. 14. In the choice of the spot for the performance of the operation, for the sake of securing a more rapid cure, we should select this as far distant as possible from the seat of congelation, short of endangering the patient's life by a too near approach to the trunk. 15. When resection of one or more bones is indicated, it is of great importance, in order to shield the patient from the effects of purulent absorption, that we should confine our interference to the limit between the dead and living parts, without implicating the latter.

III. *Case of Removal of a Foreign Body from beneath the Heart.* By Dr. E. S. Cooper. (From Trans. of San Francisco Medico-Chirurgical Association, 1857.)

This is another of the extraordinary cases in which American practice seems so fertile; and the truthfulness of the narration is vouched for by several members of the profession residing at San Francisco.

Mr. Beal, aged twenty-five, while exploding an old gun, received an iron slug, that had been used as a temporary breach-pin, in his left side below the arm-pit. It fractured the sixth rib, entered the chest, and, as was afterwards found, lodged beneath the heart, on the vertebral column, to the right of the descending aorta. He was brought to San Francisco from the country in a state of extreme prostration, and suffering much from suffocative paroxysms; and Dr. Cooper resolved at once to give him the chance of an operation for the removal of the foreign body. He had had frequent discharges of several ounces of pus at a time from the original wound, and the left lung had ceased to act. The operation was performed April 9th, 1857—i. e., seventy-four days after the accident. As after reflecting the soft parts, and passing a probe into the aperture in the sixth rib, which was slightly carious, the breach-pin could not be felt, portions of the fifth, sixth, and seventh ribs were successively removed, in order to allow of ample room for further search. Some firm adventitious attachments were broken up, and exit given to at least two quarts of purulent matter. In the pleura, thickened from four to six times its natural size in places, were several large holes, through which the pulsations of the heart could be distinctly seen. The left lung was completely collapsed. At this stage of the operation the patient seemed rapidly sinking, but was revived by free doses of brandy. Reaction being re-established, chloroform, which was not employed at first, was now used in limited quantity. A sound was introduced, and the thoracic cavity explored for at least three quarters of an hour, before even an indistinct metallic touch could be perceived. The whole of the left side was explored in detail with extreme patience, and at last a metallic body seemed to be felt beneath the heart; but the pulsations of the organ were so strong against the instrument, as to render it difficult to definitively determine this. The locality of the metal being at last distinctly made out, by passing the sound between the descending aorta and the apex of the heart, a long lithotomy forceps, guided along the sound, succeeded, after several minutes' endeavour at grasping it, in removing the breach-pin. During the expansion of the forceps, the apex of the heart was lifted considerably from its natural position. It is to be regretted that the body removed is neither described nor figured.

We need not pursue the detail of the recovery, which, in spite of an intercurrent pneumonia, was complete. By August 1st the external wound had completely cicatrized; and the upper lobe of the left lung had to some extent recovered its action. No cough or pain remained; and all the functions of the system were well performed.

IV. *Observations on the Diagnosis of Hydrocele.* By Professor Nélaton. (Gaz. des Hôpitaux, 1857. No. 124.)

M. Nélaton recently addressed the following observations to his clinical class:—In some cases the diagnosis of tumours of the testis presents almost insurmountable difficulties. The slightest circumstances then acquire the highest importance, and it becomes of importance that we should not attribute to any sign a degree of confidence that it does not deserve.

The Transparency of Hydrocele.—In order that this should be effectually exhibited, we should take care that the patient is not exposed in broad day-light. Another point just as indispensable is often neglected. When the surgeon commences his exploration, the sudden impression of cold causes a contraction of the dartos, and however slightly the size of the tumour may allow of its rising towards the ring, to that extent the scrotum becomes relaxed, wrinkled, and increased in thickness. This is one of the impediments to transparency, but there is another of much more importance. This ascending movement, by bringing the tumour nearer the axis of the body, prevents the light from falling perpendicularly on its surface; and the rays which fall under too oblique an incidence do not penetrate the tumour, and consequently cannot exhibit its transparency. It becomes necessary, therefore, to isolate the tumour as much as possible, to, so to speak, enucleate it, by taking hold of it near the ring and pressing it forward, separate it as much as possible from the other parts of the body. In this way, the wrinkles of the scrotum also disappear, and the stretched skin diminishes in thickness. Transparency may now be easily shown, by placing the light very close (two or three centimetres), and on a transverse axis, passing through the middle of the tumour, so that the rays may traverse it unreflected. This precaution, of no account in simple cases in which error is well nigh impossible, is indispensable in those in which the surgeon remains undecided as to the nature of the disease, precisely because he cannot establish the transparency. M. Nélaton has met with many cases in which the surgeon, from want of being aware of these facts, has mistaken hydrocele for far more important affections of the testis.

Specific Gravity.—Most surgeons attach very great importance to this sign, but it will be easy to show that it does not deserve the confidence placed in it. The hand, raising the tumour, has to estimate the weight of the entire mass; and these tumours, when even of the same nature, possess very different amounts of movability, accordingly as they are attached by pedicles, letting the hand pass on all sides, or are bound down by the contraction of the cremaster, dartos, and scrotum. Moreover, we have not to appreciate the absolute weight of the tumour, but its relative specific weight, as compared with that of another mass of a different size—a mass not now at hand capable of being compared, but estimated at some former period, under similar unfavourable conditions, its specific gravity being retained in the memory.

Let a piece of gold of a certain volume be placed in the hand of an individual, and a week afterwards give him a piece of copper of the same volume, desiring him to appreciate the relative specific weight of the two metals. Certainly he will not do this readily, and the task will become far more difficult if we present to him pieces of different size. And yet is the specific weight of gold more than double that of copper. What must happen, then, when we have to compare with each other, under the above-mentioned unfavourable conditions, masses of a specific weight so slightly differing as hydrocele and the other diseases of the testis? For, in fact, the difference of the specific weight of the liquid of hydrocele, and of that of the matters constituting other diseases of the testis, is almost insignificant. Of this we may be easily convinced by examining the figures M. Nélaton has obtained by comparing the weight of various tumours with the weight of the same volume of water.

A hydatid cyst of the testis, weighing 466 grammes in the air, displaced 450 of water, giving a difference of less than $\frac{1}{30}$. An encephaloid tumour gave a difference of $\frac{1}{40}$, and a cancerous sarcocele gave a difference of about $\frac{1}{13}$. Now it is evident that a difference even of $\frac{1}{13}$ is quite inappreciable in the conditions under which the surgeon operates, while the density of the serosity of hydrocele is somewhat greater than that of water, and in the experiments the weight of the tumours are compared with that of water, without taking into account the addition of tissues which exist in the living subject. But these tissues, viz., the testis and its coverings, are nearly of the same density as encephaloid matter. It may be then said that the sign drawn from the specific gravity of tumour of the testis is positively of no value. It is one of those signs invented in the study, and has continued to be handed down to us because no one has thought of examining into its exactitude.

V. *Hydrocele complicated with Parorchidium.* By Dr. Gherini. (Annali Universali di Medicina, vol. 159, pp. 118-123.)

Dr. Gherini not being aware of any cases of hydrocele complicated with parorchidium, or undescended testis, being on record, relates two cases which have come under his care at the Maggiore Hospital at Milan. The first case occurred in the person of a peasant, aged thirty, who had for a long period observed a tumour in the groin. This had now attained a considerable size, and projected somewhat beyond the external ring, this portion exhibiting transparency. The absence of the testis on that side, as well as of the symptoms of hernia, and the existence of fluctuation, pretty well established the nature of the case. On the inguinal canal being cautiously but freely laid open, a large quantity of fluid was discharged. The canal terminated in a blind sac, and at about its middle there lay a sensitive body, supposed to be the testis. Profuse suppuration followed, and this extending around the vicinity of the part operated upon, some incisions became necessary. The patient left the hospital quite well at the end of two months. The other patient was also a peasant, aged forty-eight. He stated he had perceived the swelling only a few days before his entering. The canal was fully distended with a fluctuating, insensible, and irreducible tumour. After it was opened, and the fluid discharged, the atrophied testis was observed at its blind extremity. Peritonitis was soon set up, and the patient died two days after the performance of the operation. The author suggests that in future cases iodine injections should be employed in place of incision.

VI. *On the Causes of the Pneumonia which supervenes upon Laryngotomy.* By Professor Schuh. (Wien Wochensch., 1857, No. 20.)

All surgeons of experience are aware that pneumonia is sometimes observed after the performance of laryngotomy or tracheotomy; but observers are by no means agreed upon the causes of this. Most persons, however, seem of opinion that the operation itself does not bear any direct causal relation to this occurrence. Professor Schuh entirely differs from them, and the performance of a very large number of operations upon the air-passages, during his twenty-three years' attendance at the Vienna Hospital, enables him to speak with authority upon the subject. Although a great advocate for these operations under a variety of circumstances, he is convinced that the altered position and amount of the column of air that is admitted into the lungs is not unfrequently the sole cause of the supervening pneumonia. The following are the grounds for this opinion :—

1. The air, after the operation, enters the lungs by a shorter passage, and by one that is straight in place of being curved, as before; and it does not pass through an aperture which is alternately widened and contracted, as is the case with the *rima glottidis*. The column of air, too, which passes through the canula is larger than that which traverses the glottis, for if a smaller canula were employed, it would be liable to dangerous obstruction. We have thus two important changes in the mechanical conditions of respiration; and the lung becomes exposed to the pressure and impulse of a larger column of air, arriving more rapidly by a shorter passage. This, so tender and vascular an organ will not always support, and inflammation may be easily excited, just as it may when, in the operation of paracentesis thoracis, the

fluid is too rapidly drawn off, and the lung is too suddenly exposed to the pressure of the air. 2. Experience confirms what *à priori* might have been expected. Any one who has very frequently performed the operation, must have met with cases in which the patient has complained of the admission of too large a quantity of air, and has only felt at ease when the opening of the canula has been diminished a third or a half by sticking-plaster. If such an indication of an intelligent and observant patient be neglected, pneumonia will follow. 3. The author has lost several patients in whom, at the time of its performance, no signs of pneumonia could be detected, and who seemed to be going on very well to the tenth or even twenty-first day. Not only did no other cause for the development of the pneumonia exist, but this was also always found on the right side—this being on account of the greater width and shortness of the right bronchus more exposed to the impulse of the air. The disease does not come on actively, but is indicated by some acceleration of respiration and slight fever. Physical examination, however, shows that very considerable infiltration has taken place; and the neglecting to institute this may be a cause that many pneumonias have been overlooked. 4. Cases of cut-throat, in which the larynx is wholly or partially divided, also strikingly exhibit the danger of an opening into the air-passages, such patients not infrequently perishing in a few days of pneumonia, this always commencing on the right side, and in even fatal cases being usually confined to that side. It may also spring up in smaller wounds of this part, if these be not kept carefully closed either by sutures or suitable dressings and bandages.

To the question, whether pneumonia after laryngotomy can be prevented, the answer is, that it can in many cases, but not in all. For this purpose no wider canula should be employed than is necessary to maintain uninterrupted respiration; and as soon as the patient can breathe freely enough through the mouth, and can both breathe and speak when its orifice is closed, it should be changed for a smaller one, or its opening should be partly closed by plaster. When the breathing continues perfectly easy, the canula being stopped, before this is entirely removed it should be allowed to remain in, completely stopped, during twenty-four hours, care being taken that it should not project inwardly, so as to narrow the normal passage for the air. The temperature of the room should never be allowed to sink below 60° Fahr.

It is often exceedingly difficult to determine the time when the canula should be finally removed. After such removal, the patient may continue to breathe quite easy for from two to eight days, when the difficulty gradually returns, until it becomes as bad as ever. If even a couple of days have passed, the re-introduction of the canula can seldom be accomplished, and then only by first passing through the canula a conical obturator, which can better overcome the elasticity of the edges of the cartilage. The longer the canula has remained prior to removal, the more readily may it be re-introduced. The recurrence of dyspnœa is especially to be apprehended when we have reason to suspect ulcer of or around the rima, open abscesses, and sinuses beneath the mucous membrane. Tumefaction rapidly diminishes, and the normal permeability is soon re-established; but on the admission of the stream of air to the diseased part by the withdrawal of the canula, the former difficulties may soon be reproduced. Hence, when the diagnosis can be established, the canula in such cases should be retained during several weeks, in order to give the surfaces time for healing. According to Professor Schuh's experience, pneumonia never comes on after the first twenty-one days are passed, and the canula may then be worn for months or years without injury. On the other hand, the Professor has lost cases by removing the canula too late, pneumonia unexpectedly appearing. The sensibility of the lung to the unusual arrival of air, is especially great when the difficulty of breathing that has given rise to the operation has been of long duration, and the organ has become enfeebled by venous congestion and a diminution of the contractile power of its cells. In a case in which Professor Schuh performed laryngotomy in order to facilitate the removal of a large pharyngeal polypus, the patient, who had suffered for months from a difficulty of breathing, was quite well on the day of the operation. The canula having, however, been left in during twenty-four hours, pneumonia was detected by auscultation within this period.

Thus, it results from what has been said, that pneumonia is sometimes a consequence of breathing through an artificial opening; and by due regulation of the size of the volume of air, the temperature of the room, and the timely removal of the canula, it may usually be prevented. This, however, is not always the case, for the condition of the patient may require a long retention of the canula, the lung may be excessively sensible to the changed mechanism, and art has as yet furnished no apparatus as a substitute for the alternated dilatation and contraction of the glottis.

QUARTERLY REPORT ON MIDWIFERY.

By Robert Barnes, M.D.,

PHYSICIAN TO THE ROYAL MATERNITY CHARITY.

I. Pathology of Non-Pregnant Woman.

1. *Case of Ovarian Tumour: Iodine Injection, Excision, Death.* By M. Kempf, M.D. (North Amer. Med. Chir. Rev. September, 1857.)
2. *Case of Successful Ovariotomy:* By Dr. H. N. Bennett. (Amer. Journ. of Med. Sc. October, 1857.)
3. *Account of a Case in which both Ovaries were Extirpated.* By Dr. J. H. Tinkham. (Amer. Journ. Med. Sc. October, 1857.)
4. *Entrance of Air into the Peritoneum through the Fallopian Tubes.* By Dr. Guillier. (Gazette Méd. Mars, 1857.)
5. *Extremely obstinate Menorrhagia Cured by Injection of Liquor Ferri Sesquichlorati into the Uterine Cavity.* By Dr. P. Breslau, of Munich. (Monatsschr. f. Geb. October, 1857.)
6. *On Treatment of Obstinate Menorrhagia by Iodine Injections into Uterus.* By Dr. Savage. (Lancet. December, 1857.)
7. *Retro-Uterine Hematocele.* By Dr. Engelhard. (Arch. Gén. June, 1857.)
8. *Presumed Extra-Uterine Fœtation.* By Dr. Ulrich. (Monatsschr. f. Geburtsk. September, 1857.)

1. The case of ovarian disease related by Dr. Kempf illustrates the impediment which the difficulty of accurate diagnosis puts in the way of the successful operative treatment of ovarian tumours. Dr. K. first tapped his patient, and finding no fluid pass, yet confident in his diagnosis, he entered the trocar again, and this time drew off "a limpid stream of water." In three weeks the fluid accumulated; it was again drawn off, and an ounce of tincture of iodine injected. It is said that no unpleasant symptoms followed, but no benefit was experienced. In consultation with Dr. Huhn it was determined to extirpate the tumour. Some difficulty was encountered from adhesions, especially from one to a coil of intestine, about six or seven inches in length. The tumour removed was found to be nearly *solid*, of a light straw colour, lobate, and of an elastic, fibrous structure. Imbedded in its substance were a number of bodies of a light brown, and others of a darker colour, varying in size from that of a bean to an acorn, ovoidal in shape, and of a caseous consistence. The weight of the mass was three pounds.

Dr. K. adds, with just candour, "as the tumour proved to be solid, the water which I drew off necessarily came from the peritoneal cavity, and the injection of iodine entered the same."

[The patient sank on the seventh day. This case does not show the tolerance of the healthy peritoneum of the injection of an ounce of tincture of iodine, for this membrane was probably diseased. In one case, where the tincture was through error in diagnosis injected into the peritoneum in a London hospital, acute inflammation set in, which destroyed the patient.—REPORTER.]

2. Dr. H. N. Bennett, an American physician, records a successful case of ovariotomy. The diagnosis of an ovarian tumour was not clearly brought out until a tapping, by which twelve pints of a tenacious fluid were evacuated from the *peritoneal sac*, had been made. Then a solid tumour was felt. When the peritoneum was opened in the abdominal section (the large incision), a further large quantity of semi-transparent fluid escaped. The removal of the tumour was effected without much difficulty; the pedicle was secured by transfixing it, and tying by a double ligature. The tumour was a multilocular one, of a nearly globular form, and measured seventeen inches in circumference. The largest cyst had not a capacity exceeding six ounces.

The patient recovered favourably, and had menstruated normally at date of last report.

3. Dr. Potter's is a case of extirpation of both ovaries. A married lady, aged twenty-five, had an abdominal tumour, which in two years' growth had attained an immense size. It had never been tapped before. Tapped by Dr. Potter, it yielded nine pounds of a dark pasty-looking fluid. Ovariotomy determined upon, the abdomen was opened by the small incision. The tumour was slightly adherent to the omentum. The tumour tapped yielded a large quantity of fluid like water. This did not empty the tumour, so another cyst was punctured, which gave a similar quantity of fluid, but of a darker colour and more tenacious. As the size of the tumour was still too great to admit of its being dragged through the opening, the incision was prolonged above the umbilicus about two inches. The tumour was then easily lifted out, and found to be the right ovarium, the broad ligament forming its pedicle. The pedicle was split into three parts, each being tied separately. This tumour, with its contents, weighed twenty-two pounds. The left ovarium examined was found of the size of a large hen's egg, and diseased. It was consequently removed, a single ligature being applied to its pedicle. The cut extremity of the pedicle was placed as near as possible to the lowest part of the wound. With the exception of some abdominal pain and vomiting for some days, no bad symptoms arose, and the patient was discharged in about five weeks.

4. Dr. Guillier relates an example of presumed forcing of air into the peritoneum through the uterus and Fallopian tubes. He had applied a pessary to a woman, aged forty, on account of prolapsus, and for cleanliness had ordered injections of warm water. After the first injections acute pains arose in the sides, which continually increased, and were attended with great anxiety. After some hours these disappeared with eructations and vomitings. This was repeated after every injection. This phenomenon seemed explained by the very low position of the uterus, and by its open mouth being put in the centre of the pessary, so that at every injection water and air would necessarily be thrown into the uterus. [The fact of air having been forced through the tubes is not satisfactorily proved in the above case. The accident is, however, possible, and should serve as a caution in throwing injections into the uterine cavity.—REPORTER.]

5. Dr. Breslau's case of injection of liquor ferri sesquichlorati shows the efficacy of this treatment in certain cases of excessive uterine hæmorrhage. A

woman, forty-five years old, had worn a pessary for a long time, which she had given up on account of pain and hæmorrhages. Examined, there were found five grape-shaped polypi around the os uteri, with ulceration. These were removed by Siebold's scissors, and potassa fusa applied to the ulcerations. The hæmorrhages remitted somewhat. The uterus was, however, entirely bent upon itself, and the menses returned in great excess. The cavity of the uterus was somewhat enlarged. The return of the menorrhagia reduced the patient to an extreme degree of anæmia. Ergot of rye failed to effect any contraction of uterus or arrest of flooding. Two possible conditions presented themselves to Dr. Breslau. 1st. The five polypi attached to the cervix favoured the presumption that there existed a similar warty hypertrophy of the lining membrane of the uterus. 2nd. There might be a destructive ulcerative process of a malignant character going on in the same structure. In the first case, the curette of Récamier seemed indicated, in order to scrape the uterine membrane clean from the presumed excrescences. In the second case, it seemed necessary to bring a caustic and styptic agent in direct contact with the diseased membrane. To answer this latter indication, he selected the liquor ferri sesquichlorati of the Bavarian Pharmacopœia. Having first straightened the retroflected uterus by the sound, and inserted an elastic catheter as far as the fundus, he injected one ounce and a half of the liquor ferri, diluted with an equal quantity of water. The injected fluid was retained in the uterine cavity for a minute and a half by the pressure of the fingers at the os around the catheter. During the operation, the patient felt a dull labour-like pain, which lasted for two hours. The hæmorrhage, which had hitherto been unintermitting, now suddenly stopped, and was not renewed. After some days, brown, crumbling clots were discharged, but no fluid blood. Seven months afterwards there had been no return of menorrhagia. The patient menstruated regularly every twenty-one to twenty-four days; and through internal administration of steel and quinine, recovered robust health.

6. Dr. Savage has more recently ('Lancet,' December last) detailed two cases of obstinate menorrhagia, in one of which he injected first a strong solution of tannin and alum, which was successful for a time. The hæmorrhage returning, the uterine cavity was scraped out by Récamier's curette. The patient said the operation gave her no pain. Some days later, three drachms of the London tincture of iodine were injected, and repeated twice at intervals of three days. The floodings quite stopped, and the patient recovered strength. In the other case, two ounces of tincture of iodine, with an equal quantity of water, were injected, with an equally successful result. Dr. Savage lays stress upon the importance of dilating the cervix uteri freely before resorting to iodine injections.

7. Dr. Engelhard relates a case of retro-uterine hematocele, with the autopsy. A washerwoman, aged thirty-eight, had menstruated regularly every three weeks since fourteen, and had a good labour at seventeen. For three months, without known reason, the catamenia had ceased, and every three weeks pain in the abdomen, and constipation set in. This at first gave way, through rest alone. But on the 3rd of March, she was compelled to enter the hospital, where bleedings and counter-irritation brought her only temporary mitigation. For eight days she had suppression of urine; and on the 25th of March, examination showed the cervix uteri lower down, pressed against the anterior wall of the vagina, and closed, and longer than usual. At the fundus of the posterior vaginal wall was a large, projecting, hard swelling, which compressed the uterus strongly in front, and the rectum behind. By the rectum a soft place was felt in this swelling. With the sound, the uterus was easily penetrated, and the tumour was thus felt to be appended to it. Also through the abdominal walls, the swelling could be felt in the left iliac fossa. The

diagnosis made was a fibrous tumour in the posterior uterine wall, with perhaps a cyst included. After the patient had suffered much pain, vomiting, diarrhœa, to combat which, poultices, leeches, mercurial inunctions, and opium were used without success, she died on the 1st of May.

Autopsy, thirty-six hours after death.—On opening the abdomen about two pints of sero-purulent fluid, mixed with false membranes, escaped. The whole peritoneum was of a dark-grey, becoming darker still in the pelvis. All the organs were cemented together by false membranes. To the left, under the intestines, was a cavity filled with old frothy, putrid, blood-coagula. Between the rectum and promontory was a small serous cyst, filled with thick fluid. The cavity was formed by the retro-uterine cul-de-sac, in front by the somewhat elongated uterus and broad ligaments, behind by the rectum, laterally by the cohering ovaries and broad ligaments, and above by the intestines, which were also cemented together. Through the rectum penetrated two round openings the size of a fourpenny piece. The uterus, of normal consistence, was lengthened. Its cavity showed no mark of tubal openings. When it was attempted to remove the exudation from the appendages, a cavity of thick yellow pus, apparently in the situation of the left ovary, was opened. No trace was found of the right ovary.

Dr. Ulrich's case of presumed extra-uterine pregnancy was probably one analogous to the foregoing—namely, a case of retro-uterine hematocele. The doubt shows the importance of studying this affection carefully by the collation of cases. A woman, aged twenty-five, was received into the hospital on the 15th of January. She said that fourteen days previously the catamenia had appeared regularly, but the discharge had suddenly ceased, after a chill in washing, on the following day. Until the sixteenth day she had felt well, then in the night acute pains in the abdomen seized her. On her reception she still complained of acute pain in the right hypogastric and iliac region, increased by pressure. The skin was hot, pulse small and very frequent; countenance anxious; percussion in the right iliac region gave a clear tympanitic sound. The uterus was low in the pelvis. On the right side at the roof of the vagina and behind the uterus was a very painful tumour, which could not be separated from the uterus, and partly filled the right iliac fossa. Leeches, poultices. On the 25th, the symptoms, which had remitted, suddenly returned with great severity. The pain was quickly relieved by leeches to the os uteri. On the 7th of February, intense pains again; cold sweats; small pulse; meteorism of belly; dulness on percussion of the whole right side of abdomen; repeated vomiting of green fluid. Death.

Autopsy.—In the abdominal cavity was a quantity of half-fluid half-congealed blood; general peritonitis and gluing to the viscera. In the pelvic cavity on the right, and behind the uterus, was a round tumour the size of a fist, covered with coagula. The tumour itself was formed of partly old, partly fresh coagula. The uterus and tumour being removed together, were more minutely examined. The contents of the tumour consisted of laminated coagula. The anterior wall of the sac was formed by the posterior wall of the uterus and broad ligament; in the upper wall ran the right tube, which exhibited at its uterine end a dilatation of the size of a walnut. The posterior wall of this dilatation was so ruptured near the sac, that a sound passed into the sac by the far end of the tube. The tube was closed at the uterine end.

[No trace of a fœtus or ovum could be detected. Ulrich, notwithstanding, forms the idea of extra-uterine pregnancy. In this we cannot concur. The sudden arrest of menstruation, the subsequent symptoms, the nature of the tumour, verified by post-mortem examination, seem to point clearly to hæmorrhages from the Fallopian tube, probably the result of ovarian congestion, caused by the arrested menstruation.—REPORTER.]

II. Pregnancy and Labour.

1. *A Case of Pregnancy in a Female in whom the Menstrual Function had been for some years suspended.* By O. C. Gibbs, M.D. (North American Med.-Chir. Review. September, 1857.)
2. *The Vascular System of the Gravid Uterus.* By Virchow. (Monatsschr. f. Geburtsk. October, 1857.)
3. *Case of Turning by External Manipulation.* (Monatss. f. Geb. Sept. 1857.)
4. *Case of Retained Placenta.* By Dr. Wustefeld. (Mediz. Vereins-Zeitung. November 18, 1857.)
5. *On Secondary Hæmorrhage.* By Dr. Cock. (New York Journal of Med. July, 1857.)

1. Dr. Gibbs' case.—Mrs. A., aged thirty-two, had been married ten years, had never borne children nor aborted, nor had unnatural uterine hæmorrhage. From the commencement of her menstrual period until about three months subsequent to her marriage, she had been quite regular in her catamenia. From this time she became quite irregular, both as to the time and quantity of her menstrual flow, the time varying from six weeks to six months, and the quantity unusually small. For the first seven years succeeding her marriage this irregularity continued. During the eighth year she menstruated but once, and during the ninth and tenth not at all. The abdomen had slowly but steadily enlarged for five years, though more rapidly during the last few months. This history seemed to negative pregnancy, and she was treated for ascites, encysted dropsy, &c. At last a vaginal examination detected ballottement. A month after this she was taken in labour, and was delivered of a male child, to all appearances fully developed, but weighing only three pounds and a half. The liquor amnii was excessive, being about six or eight quarts. There was considerable fluid remaining in the abdomen after labour, showing that the pregnancy was complicated with ascites. The woman recovered, the ascites passing away without treatment. The child died at two months. After an interval (not specified) there had been no appearance of catamenia.

2. Professor Virchow, in demonstrating an injected uterus of the fifth month to the Berlin Obstetrical Society, drew attention to several points of interest in its vascular system. Pointing out the enormous development of the whole system of the internal spermatic vein, in a large pampiniform plexus, he observed that this increase in the stream-capacity of the venous blood-channels created a strong disposition to renal hypertrophies, which under certain circumstances might lead to the excretion of albumen, and even to uræmic symptoms, especially when no collateral circulation was present to divert the blood from these organs. In the present preparation, however, a collateral route was observed, leading from the internal spermatic into the soft parts in the retroperitoneal region. This was, according to Professor Virchow, a variety of the circulation frequent in pregnancy. [This view offers a different explanation of the occurrence of albuminuria in pregnancy from the one usually received, namely, that it is the result of pressure upon the renal veins.] Pointing out the difference between the arterial and venous systems, he showed that the arteries ran as small winding cords alongside the veins, and especially exhibited at the seat of placental attachment a corkscrew form. Through this winding course, and through its much smaller capacity as compared with that of the veins, a considerable retardation of the blood-stream was effected, since the return of the blood from the wide veins could not go forward so quickly. All this operated favourably upon the active nutrition-relations of the uterus, and prevented the process of hypertrophization during gestation from exceeding the normal degree, as occasionally happens in new formations when the rapid current of arterial blood causes a correspondingly rapid growth. The weakening of the lateral pressure on the vessels further served to the preserva-

tion of the utero-placental circulation, which is principally provided directly from the internal spermatic artery. On the inner uterine surface the chorion spread even to the os internum, and there was seen the nearer one approached the placental seat, a progressive enlargement of the venous vessels, which finally passed over into the placental sinuses, where the injection-mass formed berry-shaped lumps. Virchow asserted that a better injection than in these berry-shaped varicosities could not be obtained, into which, on minute examination, the fœtal villi could be seen projecting. These villi, Virchow repeated, were not covered with an investment from the maternal system, but floated free in the large sinuses; that the epithelium formed upon them belonged to their proper structure, and that the same conditions obtained in extra-uterine ova, where the vascular arrangements were often quite dissimilar.

3. The operation of version of the fœtus in utero by external manipulation is not yet an established one in obstetric practice. Cases where it has been successfully performed are of special interest. We extract one from Professor Grenzer's Report of the Dresden Lying-in Hospital. A strong, well-built woman, aged thirty-two, who had borne three children happily, was brought in in labour on September the 7th. The abdomen appeared stretched more in the transverse direction. The os uteri was very little opened, and the right elbow of the child presented. Through the thin abdominal and uterine walls the head was distinctly felt in the left iliac fossa, the breech opposite in the right side of the uterus. The woman lying on her back, it was then attempted in the intervals of the pains to push the head downwards and the back upwards, whilst in the acme of the pains the uterus was merely compressed on either side. These manipulations were continued for half an hour, then the patient was made to lay on the left side, and in the place where the head was felt, a hard pillow was pressed. On examination the elbow was no longer felt, neither could any other part. In the mean time the os uteri had expanded somewhat. The patient was kept in the same posture, and at six p.m. the head was felt by ballottement in the brim. At noon next day the os had fully opened, the liquor amnii escaped, and in one hour and three-quarters a living child, weighing eight pounds, was born in the first cranial position. The mother did well.

4. Dr. Wüstefeld's case of retained placenta exhibits another phase of the consequences of this accident. A robust woman of twenty-three was delivered in September, 1855, after an easy labour. Since, however, she had been confined to her bed by profuse and frequent hæmorrhage, which so exhausted her that death seemed impending. On examination, the uterus was found of the size of two fists clenched together, and still filled with remains of placenta. These were with some difficulty removed. Appropriate treatment was ordered for the patient, now reduced to a skeleton. She completely recovered.

5. Dr. Cock, in his essay on secondary uterine hæmorrhage, follows closely the arrangement given by Dr. M'Clintock in his able memoir published in the 'Dublin Quarterly Journal,' in May, 1851. It is unnecessary to follow Dr. Cock throughout his essay. We extract one case of a class well known, it is true, but of special interest now in connexion with a recent charge of malpractice. A woman, aged twenty-eight, entered the New York Hospital, October 29th, 1856, in her fourth labour. Her previous labours had been lingering, and she had had floodings. She was delivered on the 30th, and hæmorrhage ensued from atony of the uterus. The placenta was partially removed, portions having remained attached to the uterus. I saw her for the first time on the fourth day after labour, and found her exhibiting in a marked degree the effects of loss of blood. Portions of the placenta had been expelled with hæmorrhage. By examination I found a portion of placenta within the grasp of the os uteri, and removed it. Hæmorrhage recurred the next day,

and under the reiterated losses the woman succumbed. On post-mortem examination, a piece of placenta was found near the fundus of the firmly-contracted uterus; pus was found abundantly in one ovary.

Dr. Cock adds: two autopsies, in addition to the above, have shown pieces of retained placenta, giving rise to phlebitis.

III. The Puerperal State.

1. *A Peculiar Puerperal Disease.* (The Fiske Prize Essay.) By David Hutchinson, M.D. (Amer. Journ. of Med. Science. Oct. 1857.)
2. *On the Investigation of the Causes of Puerperal Fever.* By Professor A. Martin. (Monatsschr. f. Geburtskunde. October, 1857.)

1. Dr. David Hutchinson, of the United States, has drawn up a dissertation on a form of puerperal disease, not indeed unknown in this country, but rare of late. It appears to have been very prevalent in certain parts of the United States; and the subject is of sufficient importance to justify a rather full analysis. Its general features are so well drawn by the late Dr. Abercrombie in a case narrated by him, that we cannot present them in a more condensed or clearer view:—"A lady, aged thirty, came under my care in the spring of 1830, affected in the following manner: she had a remarkable tenderness on the inside of the lips, the tongue, and the throat; a constant discharge of saliva, a burning uneasiness of the tongue, throat, breast, and stomach, and great uneasiness in swallowing, and for some time after it. She had a constant tendency to diarrhœa, and a feeling as if food did not remain in the stomach, but passed immediately through the bowels. There was some cough, with frequent pulse, great debility, and increasing emaciation. The throat appeared raw, and a little inflamed, the edges of the tongue and the inside of the under lip were excoriated, and covered with small ulcers having inflamed margins. There was also a painful excoriation about the anus and the labia. The complaint was of three months' standing, and had begun while she was in the puerperal state in England. A variety of treatment had been employed without benefit; she became emaciated to the greatest degree; the diarrhœa became incessant, with much pain, and a feeling as if everything passed through her immediately. She had no relief but from large opiates, and that relief was but slight and temporary. When the case appeared to be hopeless, she began to take a decoction of logwood, 1 oz. to 1 lb. of water, a wineglassful four times a-day, combined with a small opiate. From this time she recovered daily, and in two or three weeks was in perfect health."

This case shows the general character of the disease. It attacked the mucous membranes of the mouth, air-passages, stomach, and intestines, even to the extremity of the anus and the labia. The next case, communicated by Dr. Brainard, United States, shows the general effects of this affection:—

"A woman, aged thirty-five, had been affected for a long time with pain in the back, hips, &c., for which various remedies had been used without effect. On inquiry he found the symptoms dated from lactation, and were attended with debility. On examination, several minute points were seen about the orifice of the vagina, scarcely perceptible to the eye, but which, when the surface was touched with a solution of lunar caustic, turned white, revealing the existence of numerous ulcerated points. It were easy," adds Dr. Brainard, "to add to these cases others where the ulceration of the mouth alternated with diarrhœa, indicating a transfer of the ulceration from the intestinal mucous membrane to that of the mouth, and *vice versâ*.

The two following cases from Dr. Hutchinson are further illustrative:

Mrs. W., whilst nursing her first child, had ulcers on the sides of the tongue; mouth very tender; child three months old, and was labouring under dysentery in a mild form; the dysenteric symptoms were relieved in a few days, after which she was placed on iodide of potass, five grains three times a day, when the ulcers began to heal, and by a continuance in the remedy for a month, she was entirely relieved, and continued to nurse her child. Frequent cases of a similar character came under my care, and were relieved by similar treatment.

The case that follows shows a more acute form, but for this we must refer the reader to the original.

The above cases may suffice to give a clear view of the symptomatology.

The Anatomical Lesions.—In the few dissections that have been made, ulcerations of the mucous membrane of the intestinal canal have existed in every instance. In the 'Transactions of the Indiana State Medical Society' for 1856, Dr. Maclean relates the post-mortem of a case in which the mouth and fauces were entirely denuded of their mucous coat, with numerous patches of ulceration extending throughout the œsophagus. The stomach was also almost completely denuded of its mucous coat, with numerous patches of ulceration extending deep into its muscular tissue. A small space around the pyloric orifice was the only healthy portion. The duodenum was healthy. There were a few inflammatory patches in the colon. The bladder had traces of inflammation around its neck; and a few patches of ulceration existed in the vagina.

Etiology.—Dr. Hutchinson enters upon an elaborate discussion of the causes, which he divides into extrinsic and intrinsic. There appears reason to believe that a certain epidemic constitution had influence. It was rarely seen in the Western States until after the appearance of dysentery and diarrhœa in 1849, 1850, 1851, 1852, 1853, and 1854. During the ten years preceding 1849, but two cases of a mild character came under his observation. After the appearance of dysentery, the affection became more common. The affection of the mouth was associated with dysenteric symptoms. In those years, aphthous stomatitis was not an unfrequent accompaniment of dysentery in its latter stages; and in several instances cancrum oris supervened in children. Since dysentery and other diseases of the digestive tube have been less frequent, we have seldom seen this affection. The intrinsic causes resolve themselves into conditions leading to blood-dyscrasia and debility—conditions frequently present in child-bearing and suckling women, independently of any malarious or epidemic influence.

Treatment.—The relation of the cases, and the general view of the pathology of the diseases, dispenses with the necessity of citing at length the author's opinions as to treatment. The principal is the administration of tonics. [We may add, that in analogous cases (not unfrequently met with in London) we have found quinine and mineral acids, occasionally combined with iron and calumba, and the best diet procurable, the most successful treatment. When there are hectic and night-sweats, and much nervous depression and irritability, we have derived the most especial benefit from the addition to the above treatment of three grains of phosphate of zinc, and four of extract of conium, at night. Occasionally we have given the phosphate of zinc in solution, in dilute phosphoric acid, combined with tincture of cinchona or quinine, or without these additions. For two years we have used this remedy extensively, and believe it is well worthy of introduction to the notice of the profession.—Rep.]

2. Professor A. Martin, Director of the Lying-in Hospital of Munich, enters into an elaborate discussion of the causes of puerperal fever, taking for the basis and motive of his inquiries an epidemic which prevailed in that institution, between December, 1856, and July, 1857. [Frequently as the subject has been discussed, it is still, and must ever remain, one of foremost interest so long as the disease shall continue to recur. The very fact of the constant re-appearance of the disease is evidence enough either that the etiology is not yet clear, or that the practical lessons flowing from an etiological knowledge are disregarded. The careful investigation of the circumstances attending the rise and progress of every outbreak is a duty incumbent upon every director of a

lying-in institution, and the recording of the teachings of such investigation is a duty no less incumbent upon us. The question is no doubt of greater importance in France and Germany than in England, since on the Continent a very large proportion of parturient women are delivered in public or private lying-in hospitals.—REPORTER.]

The facts connected with the Munich epidemics are remarkable. The hospital in which the last epidemic appeared was a new building. The construction was carefully adapted to its purposes. Cleanliness and ventilation were scrupulously enforced. Dead bodies were always speedily removed to a distant building. The discharges, placentas, &c., were immediately placed in air-tight vessels, pending their removal. The syringes, catheters, &c., used in the sick wards, were strictly confined to the use of the patients in them. The sick women were isolated in separate wards or chambers. The attendants were enjoined to wash their hands in chlorine-water. As in the Dublin Lying-in Hospital, the wards were used in rotation, some being always empty, to allow of time for cleansing. In short, no care seems to have been spared. Yet the disease spread. From the 1st of October, 1856, to the end of July, 1857, 1090 patients were admitted. Of these, 88 suffered from puerperal fever and allied pathological affections, as metritis, phlegmasia alba, phlebitis, &c. Of these 88 cases, 47 recovered, and 37 died, leaving 4 under treatment. One circumstance discussed deserves mention, although it cannot have exerted material influence in the production of the disease. The building was lighted with gas; some of the gas-pipes leaked, and for a time all the wards were tainted with gas-stench. Some of the attendants who slept near the pipes complained of vertigo, headache, prostration, and diarrhœa; and as similar symptoms appeared amongst the patients, it was determined for a while to discontinue the gas-lighting. The most probable cause appears to have been cadaveric infection. During January and February no serious illnesses having appeared, suddenly, on one and the same day, two puerperal women were seized with fever. Both had been delivered normally nearly at the same hour. In neither case could any cause be detected. At last it appeared that an assistant, without the knowledge of the directors, had examined the body of a child in the remote dead-house, having indeed, as he declared, carefully washed with chlorine water, and had immediately afterwards examined these two women, and no others. No other women were affected at the time. The guilty assistant confessed that the same thing had happened to him at the outset of the fever in December, when also the patients examined by him were the first seized. The sicknesses thus originating in December and the end of February were followed by several cases more or less severe of puerperal fever, and it required a space of sixteen or twenty-one days to restore more satisfactory relations. It is further observed that the clinique of the hospital was held every morning from ten to eleven o'clock, when a great number of practitioners proceeding direct from the neighbouring cliniques, where they had visited typhoid patients, and often even from the anatomical theatres, came in. Students also engaged in microscopical pursuits visited the wards.

The hospital was shut up at the end of April. When first re-opened, the sicknesses were milder in form and less frequent. But when the clinique was re-opened in July, and students attended, several severe and rapidly fatal cases occurred. These ceased when the clinique terminated at the end of the session.

[These facts point to a clear and imperative practical lesson. No student engaged in dissection should be suffered to attend cases of labour. The experience of Semelweiss, at Vienna, had already made this clear enough. It is criminal to disregard it. In reference to this subject we beg to call particular attention to the admirable rules and cautions enforced by Dr. M'Clintock, the Master of the Dublin Lying-in Hospital, as related in a most interesting introductory lecture recently delivered to the students of that hospital.—REPORTER.]

MEDICAL INTELLIGENCE.

The Hospital for Sick Children.

Those who have seen much of dispensary practice, and have visited the poor frequently at their own homes, know how utterly inadequate is the accommodation for sick children in their crowded and scantily-furnished dwellings. The rest of body and mind which is the best adjuvant in our medicinal treatment, is too commonly unattainable, the separation of the sick from the healthy being impossible; while the attention and attendance requisite for the patient are so much time and labour withdrawn from the necessities of existence. Sick children cannot be admitted into ordinary hospitals, for the very reason that they demand peculiar care and watchfulness, and that it is necessary to make special provision for them, such as hospitals will not or cannot supply. We much regret that it is so, and think that no metropolitan hospital should be without one or more wards set aside for the reception of children under seven years of age, in order that the immediate philanthropic objects of the hospital might be more fully realized; that the study of infantile disease might be within the range of all medical students; and that every hospital might offer means of training nurses to the peculiar requirements of these cases. But whether these *pia desideria* were or were not realized, it would be equally desirable, for the reasons mentioned, that a hospital devoted exclusively to the reception of young children should, not barely exist, but flourish, in this metropolis. After six years of hard labour to secure an existence, the Children's Hospital in Great Ormond-street, Queen's-square, which was founded by Dr. West, is in danger of ceasing to confer the benefits it has during that time realized. Instead of occupying a prominent position among the charities of London, the Committee fear that they will no longer be able to maintain the present small number of thirty-one beds, though 100 beds, which was the number originally contemplated, are not more than absolutely necessary to supply the requirements of the numerous out-patients, to answer the purposes of the instruction of medical students, and the efficient training of young women as children's nurses.

We now bring this institution especially under the notice of our readers, because, for the cause of science and Christian philanthropy, we would earnestly recommend its interests to their kind consideration. A great effort is now being made to create two funds—an endowment fund, to maintain the present activity of the hospital; and a building fund, to provide for its further increase, and thus to ensure for the Children's Hospital a permanent place among the charitable institutions of the country.

Under the presidency of Charles Dickens, whose sympathy with all that is good and noble is proverbial, and whose appeal on the occasion may, we trust, draw golden opinions, a dinner is to be held in February, which we earnestly hope may succeed in establishing the Children's Hospital in Great Ormond-street on a footing worthy of its objects, of the wealth of this great metropolis, and of the scientific eminence of Dr. West and his coadjutors.

The Sydenham Society.

"Le Roi est mort, vive le Roi." The Sydenham Society has just expired, and though not yet *rediviva*, great efforts are being made to recal the vital spark, and again infuse life into the corpse. That the late Society has conferred a great boon upon the profession of this country there can, we think, scarcely be a doubt; and while it is very possible that the time had arrived at which its regeneration was desirable, and at which it became necessary that such an association should be guided by somewhat different principles from those upon which the Council have hitherto proceeded, we are equally confident that the class of literature which has been rendered accessible to the profession of this country by the agency of the old Sydenham Society, has tended much to elevate the scientific status of its members.

The old Society, we know, often had under consideration the propriety of entering upon the publication of more modern and more strictly practical works than the majority of those are which owe their reproduction to it during the last fourteen years. If the new Society should be realized, we trust that the difficulties which in these attempts beset its predecessor, may prove surmountable, and that, with new forces at their disposal, they may commence a flourishing career. The prospectus put forward by a number of gentlemen who have met for the purpose of reconstituting themselves into a new Sydenham Society, proposes the following works as suitable to be undertaken. It will appear from the list that a much more "practical" spirit animates the projectors of the new, than pervades the works of the old, Society.

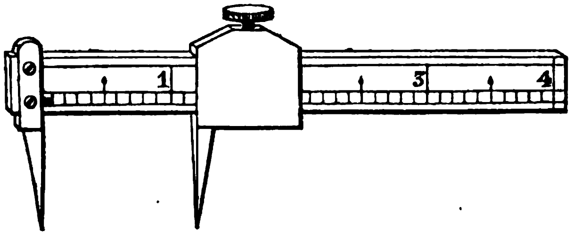
"*Works, &c., proposed by the Originators of the New Sydenham Society as suitable to be undertaken.*

"I. Annually. 'A Year Book,' to be a Register and Index for the last year. The Index part to include well-arranged references to the contents of all Journals, &c., both British and Foreign, published during the year. The Register part to consist of reports in abstract of the progress of the different branches of medical science. The compilation of the work to be entrusted to a committee. II. A volume or two of Selected Clinical Lectures on Medicine and Surgery. The lectures to be selected from the 'Medical Gazette,' 'Lancet,' Dublin Journals, 'Medical Times,' &c., of the last twenty-five years. III. Marx's 'Life of Paracelsus.' Translation from the German. IV. Hebra's work 'On Diseases of the Skin,' with atlas of plates. Translation from the German. V. Gooch 'On the More Important Diseases of Women.' 8vo. Last edition, 1832, out of print, and difficult to obtain. To be published with annotations, bringing it up to the present standard of practical knowledge. VI. Pirogoff's 'Surgical Essays.' With annotations. Translation from the German. VII. Volumes containing translations in full of Important Papers which may have recently appeared in Foreign Journals, Transactions of Societies, &c. These volumes to appear occasionally, whenever papers worthy of being so treated might present themselves. VIII. Diday 'On Hereditary Syphilis.' With annotations. IX. A volume, to consist of Extracts, Papers, &c., on the subject of Fever, by British writers during the past half-century. X. Bronzed Skin and Diseases of the Supra-Renal Capsules. A classified collection of all published facts bearing upon these diseases, with comments and a summary. Many of the cases recorded are scattered through the foreign journals, and pamphlets on the subject have appeared in several languages, each containing several original cases. XI. Dieffenbach's 'Operative Surgery.' With annotations. Translation from the German. XII. 'A Dictionary of Medical Biography.' To be undertaken by a committee. XIII. Heberden's 'Commentaries.' XIV. 'The Fathers of British Surgery.' Selections from the works of Wiseman and others. XV. 'Modern Military Surgery.' A volume to consist of Extracts, Papers, &c., either by British or foreign writers, on the more important subjects connected with the surgery of modern armies."

The Æsthesiometer.

This little instrument has been contrived and employed by Dr. Sieveking for the purpose of aiding in the diagnosis of certain forms of nervous diseases. Its employment is based upon the principle, that the capability of distinguishing the distance between two points at different parts of the body varies with the tactile sensibility of the respective regions. This power, in health, follows the general law of symmetry governing the body; hence, where in morbid conditions the tactile sensibility of one side is impaired, we have a means of determining the relative extent of the impairment by ascertaining at what distance the individual can feel two distinct impressions from two sharp points, slightly pressed upon the skin. The absolute impairment of tactile sensibility may be ascertained by comparing a given result with the tables of Professor Weber, which are contained in most handbooks of Physiology.* Thus, if a person in health is able to recognise as two distinct impressions at the tips of his fingers, points one-tenth of an inch apart, it follows that if we find him unable on one or both hands to distinguish more than four-tenths, there must be a serious impediment to the reception or conduction of tactile impressions. The nature of the impediment must of course be determined by other evidence. It is manifest that, by applying an instrument to measure the tactile sensibility of different parts involved in a paralytic affection, we secure a more trustworthy standard to judge of its extent and character than if we trust to the patient's description of his sensations, or the ruder modes of pinching and pricking ordinarily employed.

There are three main classes of circumstances in which the Æsthesiometer, of which the annexed woodcut gives a reduced illustration, has been found useful.



1. In actual paralysis, to determine the amount and extent of sensational impairment.
2. As a means of diagnosis between actual paralysis of sensation and mere subjective anæsthesia, in which the tactile powers are unaltered.
3. As a means of determining the progress of a given case of paralysis for better or for worse.

It would be superfluous to give illustrations of each of the three classes of cases in which the æsthesiometer may afford us assistance. The first and third speak for themselves; to obviate the possibility of a misunderstanding of the second, an instance is subjoined which will serve as an illustration:

E. M'M., aged fifty-two, suffered for six months before the first consultation from numbness and formication of the left hand, with severe nocturnal pains along the tips of the fingers and at their metacarpal ends; the patient rarely had pain in the thumb and none in the palm of the hand. There was frequent vertigo. To determine the character of the numbness, the æsthesiometer was applied, and the patient was found to distinguish one-tenth of an inch equally well at the tips of the middle and third fingers of both hands; the instrument aided in the determination of the diagnosis by showing that the numbness was purely subjective, and not the result of a true paralytic affection.

The instrument is one of very simple construction, being essentially what is known to mechanics as a beam compass. It consists of a rod of bell-metal, four inches in height, graduated into inches and tenths of an inch. At one end is a fixed steel point; another steel point is made to slide upon the beam, and can be fixed at any distance from the first, by a screw which works at the top of the slide. The experimenter notes down the smallest interval at which the person experimented upon is able to recognise two impressions when the points are gently and simultaneously pressed upon any given part. Certain precautions are necessary here as in all other experiments, in order to insure trustworthy results.

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* Müller's Elements of Physiology, translated by Dr. Baly. Vol. i. p. 701.

It is important that the patient should not know what is expected of him; therefore it is well not to inform him of the object with which the instrument is applied; at whatever part it is used, it is easy to prevent the points from being seen, so that the eye may not aid in the determination of the tactile impression. It is equally necessary to make the two points impinge upon the surface at the same time, in order to prevent the production of two successive impressions, which would necessarily alter the value of the result.*

Death of Dr. Blair.

It is with regret we have to announce the death of Dr. Daniel Blair, of George Town, British Guiana, which took place in November last, on his return from an exploring expedition into the interior of that wild country. His name is deserving of a place in medical biography, as the author of a valuable monograph and of an elaborate paper 'On Yellow Fever,' the latter published in this Journal. It may be mentioned for the information of those who have to give their attention specially to this disease, that the coloured drawings designed to illustrate the distinctive morbid appearances of yellow fever, have been presented to the Museum of the Army Medical Department at Fort Pitt, Chatham; and that a cabinet containing a large number of microscopical preparations, showing the organic changes peculiar to this disease, has been given to the Museum of the Royal College of Surgeons. These preparations are valuable, as exhibiting the results of Dr. Blair's latest researches.

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* The instrument may be obtained from Mr. Becker, Mathematical Instrument Maker, 39, Newman-street, Oxford-street.

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Prone and Postural Respiration in Drowning, and other Forms of Apnœa or Suspended Respiration. By Marshall Hall, M.D., F.R.S., of the Institute of France; Foreign Associate of the Academy of Medicine of Paris, &c. &c. Edited by his Son, Marshall Hall, Esq.—*London*, 1857. pp. 216.

The name of Marshall Hall is henceforth a "household word." This, the last effort of his great genius and rare practical sagacity, can be appreciated by all. Had the "Marshall Hall Method" never been devised, many pages of the history of science would have held his name, and scientific conversation would constantly have employed his language; but the history of science is an almost immeasurable book, and there are comparatively few that open it; and in our daily talk, as we grow familiar with discoveries and their applications, we often lose sight of the discoverer, and not unfrequently forget his name. Now, however, the discovery and the name will be handed down together; and many thousands who would have been hopelessly sorrowing, even while they said *lateat scintillula forsan*, will now, as their sorrow is turned into joy by the rekindling of the little spark of life, pay at once their tribute of praise and thanks to the "method" and the name of Marshall Hall.

The works which will "live after them" of some of our greatest men, are those which they produced in their youth; having all the fire of their genius, but at the same time the faults of their limited experience. The extended knowledge and mature judgment of advancing life are confined to the limited circle of those who may come into direct personal or professional contact with them. They die, and leave behind them much that in their later years they would themselves have rejected. Rarely is it the case that their time or inclination give them the opportunity or the stimulus to work. But it has not been so with Dr. Marshall Hall; during the last few years of his life, he revised and rewrote much that he had previously published: so late as 1855, he edited in Paris an 'Aperçu du Système Spinale,' in which the whole groundwork of his nervous physiology and pathology is reconsidered, and brought to the point attained by his vast observation; he lectured in America on the "Laws of Animal Life," again going over the ground he traversed more than twenty years before, when he presented to the Royal Society of London papers on the dynamics and stimuli of life: he published, in English, synoptical tables of the paroxysmal diseases, placing in a condensed form the pathology and therapeutics (as they appeared to his mind) of convulsive affections; he wrote and experimented upon paralysis, strychnia, and asphyxia; and during the last few months of his life, when suffering from disease which would have prostrated the power of any less energetic and devoted than himself, he produced the volume which has only reached us since his death.

It was not, then, needed that the name of Marshall Hall should be carried downwards on the stream of scientific history, for this his researches on the physiology of the spinal cord have done, and must have continued to do; but this work, containing as it does one of the most important, because simply and practically useful, discoveries of the day, will, by having received his name, ever bear that name upwards on the surface of the great tide of human affections.

The history of science presents us with nothing much more remarkable than the relation which discoveries occupy to previously well-known facts. For although the old maxim, *Natura non fit per saltum*, finds confirmation in every day's experience and research, there seems to be an exception to the rule in that department of nature, the mind of man, when exercising itself in scientific investigation. Again and again it has happened, that facts hitherto unobserved, and relations hitherto unconsidered, have been, as it seemed, accidentally discovered, and their discovery has thrown such floods of light upon the dark places of previous knowledge, that advances have been accomplished in a few days far greater than those which as many previous years had witnessed. Rarely is a discovery made, like that of Adams and Leverrier, step by step, until the long looked-for fact is found; more frequently by far has it been by apparently unpremeditated observation, or by the accidental confirmation of one among many vague hypotheses.

But the sudden advances which result from discovery are sudden only to those who stand outside, behind, or away from the line along which investigation is being carried; they are not sudden to him who is gradually pursuing the laborious work. To those who thought of nothing beyond the wide reach of waters that they gazed on from their homes in the olden world, the news of a new continent in the Western Hemisphere was a startling and almost incredible assertion; but to Columbus and his crew, who had steadily steered onwards to the horizon in the confident expectation of its discovery, there was but a gradual progress towards their realization of the truth. The fact that work is perseveringly carried onwards in a definite direction, implies either a confident expectation of some particular result, or a distrust and dissatisfaction with the position previously occupied, together with a belief that something would be accomplished by further toil. It may happen that the result is not precisely that which has been anticipated, it may happen that the end is reached more abruptly than even the sanguine had expected; and it may be that when attained it is such that the generality cannot quickly appreciate its value; or it may be, on the other hand, of such nature that all can at once appropriate its instruction, and being thus led into new paths, be advanced beyond all that they deemed within the range of possibility; yet to him who has worked on for years, pursuing with confidence and method the track which his own ingenuity had selected, and which his larger knowledge had taught him how to appreciate and follow, the advance is not sudden, but is gradually progressive even to the final point. While, then, we should exhibit scientific humility in remembering that any day it may happen again, as it has done heretofore, that the discovery of a simple fact or relation may subvert many of our present theories and practices, and fill us with astonishment that we have not recognised the fact before; we may also give ourselves more steadily to work, knowing that discovery is not made by those who merely indulge a Mr. Micawber-like hope that "something will turn up," but that it is always the result of earnest and faithful toil.

The researches of Dr. Marshall Hall were characterized in a pre-eminent degree by much that merits the name of discovery; and although several of his more important additions to our knowledge were of apparently accidental origin, there was no man who worked more persistently and energetically, and to whom discovery was in reality less a matter of mere chance.

It was Dr. Hall's habitual practice to think beyond and beneath the phenomena which he witnessed. He never rested satisfied with the mere record of a fact, but invariably attempted its explanation, or its comparison with other facts. With a strong belief in the possibility of arriving at purely physiological laws, he devoted himself with restless energy to the study of vital processes. We find that he occupied himself little with the study of structure, either physiological or pathological; that his classifications of disease were dynamic; that his explanations of symptoms were based upon and carried only to the point of morbid action; that the terms he applied to affections of the nervous system were constructed upon their vital relationships, and not upon their organic cause; that, in short, he treated of function rather than of organism.

It is in accordance with this tendency of his mind that we find him defining the capillary vessels, not by their structure, but by the part they take in the general function of the body, and thus they were called by him the "methæmatous vessels." Again, he treats of the "reflex function," "diastaltic nervous system," and "true spinal cord," limiting the latter not to that portion of the nervous centre which is enclosed in the spinal column, but to that portion which possesses the property of reflective action. Thus, the "spinal" cord is for him coextensive with the diastaltic function. Again, he uses the term "cerebral paralysis," but by this he does not mean that which necessarily depends upon a lesion of the cerebrum itself, but that which results from the removal of cerebral vitality from the muscles, that which is, in fact, cerebral paralysis. So with the term "spinal paralysis:" Dr. Hall did not understand that which results from injury of the spinal cord, but that which deprived the muscles of spinal influence—such, for example, as the division of a motor nerve.

The peculiar merit of the work which is placed at the commencement of this article is, that it points out a new, efficient, and "ready method" of performing artificial respiration.

The attempt to imitate the respiratory movements in cases of suspended animation is no new thing; the importance of the attempt has been fully recognised, and the difficulties to be encountered have been known; but until the discovery of the "Marshall Hall method," no successful, and at the same time ready, plan for surmounting these difficulties had been pointed out. In 1794, Dr. A. Fothergill, in his 'New Inquiry into the Suspension of Vital Action in cases of Drowning, &c.,' wrote, "the first grand indication is to renew the action of the lungs;" and Mr. R. Hamilton, in his 'Rules for Recovering Persons recently Drowned,' says: "On taking up the body, we are not to wait for an increase of heat before we begin our operations. We are to commence them by expanding the lungs *immediately*. This is not only the first but the most important part of the process." The same author also recommends the very cautious and moderate application of heat—viz., 60° or 70° Fah., remarking, "it cannot supply the principle of life; this must be sought for from the common atmosphere."

Different modes of inflating the lungs were recommended and employed at this period; but they were often ineffectual, and for two reasons—first, because the apparatus required was not constantly at hand; and secondly, because, when at hand, there were difficulties inherent in the process. These, as Dr. Fothergill showed, consisted mainly in the falling backwards of the tongue, and consequent closure of the glottis. It was therefore directed that the tongue should be drawn forward, and the trachea pressed backwards; and by such measures insufflation was sometimes performed effectually. The directions given by the Royal Humane Society for many years, contained rules for the performance of artificial respiration; but it was gradually found that, owing to the two difficulties already mentioned, they were of little or no practical utility, and were sometimes attended by mischievous results. In their later directions, in fact in those which now (December, 1857) hang upon the trees in Hyde Park, and which are given by them for general use, no mention whatever is made of artificial respiration.

Mere pressure upon the walls of the chest has been found sufficient to cause expiration, the elasticity of the chest-walls to induce inspiration; but this simple method, although sometimes succeeding, more frequently failed, owing to the position of the tongue and glottis.

Thus, although it was known that the alternate production and relaxation of pressure upon the chest-walls was sufficient to cause artificial respiratory movements; and although it was known that these movements so often caused no respiration, owing to the falling backward of the tongue, that the alternate pressure was of little practical utility, it was reserved for Dr. Marshall Hall to suggest that the body be turned on its face, to let the tongue fall forwards; to show that semi-rotation would effect the pressure and relaxation required; and to prove that, without apparatus of any kind, artificial respiration might be thus performed at once and effectually, and continued for any length of time without the least danger to the patient. The suggestion is so simple, that we know not which gives us the greatest surprise, the dulness which allowed it to pass for years unthought of, or the sagacity which originated it, and proved its utility. This is *the* fact of Dr. Hall's latest work, but there are other matters in the work before us, and we will therefore give these in succinct outline.

Normal respiration differs from the "apparent respiratory movements in continued apnœa," the former being reflex, the latter centric; both depend on carbonic acid, but the one is excited by its presence in the air-cells, the other by its presence in the spinal centre.

In respiration, carbonic acid is exhaled; in apnœa it is retained, and poisons first the brain, and then the spinal centre; the respiration is a "de-poisoning," the circulation a "self-poisoning" process.

> "In ordinary circumstances, it is the carbonic-acid gas exhaled from the blood through the fine membranous tissues of the pulmonary air-cells which, by exciting the fine fibrillæ of the pneumogastric nerves spread over those air-cells, proves the constant *excitant*, through those nerves and the spinal centre, of the normal acts of respiration." (p. 4.)

To this primary statement there is the capital objection, that rhythmical respiratory movements continue after division of the pneumogastric nerves; and there are other reasons for thinking that respiration is not entirely a reflex act, and that it is not thus excited. If respiration is voluntarily restrained, the impulse to respire becomes, after a time, insufferable; but that this is not necessarily a reflex action of inspiration excited by carbonic acid, is proved by the fact, that if the breath is held at the point of ordinary full inspiration, or, *à fortiori*, at the point of maximum forced inspiration, the irresistible impulse is one of *expiration*.

There appear to be more sufficient reasons for thinking ordinary respiration a centric rhythmic function of the medulla oblongata, than one of sensational, voluntary, or reflex action; although, in the production of the various modifications of respiration, there can be little doubt that sensation, the will, and the common diastaltic property of the spinal centre, are more or less engaged. When

> "Respiration is entirely suspended, there is no exhalation of carbonic acid, the excitant of respiration, there can be therefore no *dia*staltic respiration;

but the carbonic acid, which ought to be exhaled in the lungs, is retained in the blood, poisons it, circulates with it through the system and its various organs, and excites various abnormal conditions and actions. The mode of action is now not *dia*staltic, but centric in the spinal centre, and *ec*staltic." (p. 5.)

In such condition, the elimination of the poison is the object required, and the only mode of eliminating it is to *excite* or *imitate* respiration.

"Panting" is diastaltic, and is hyper-pnœa: "gasping" is centric or ecstaltic, and may be termed pseudo-pnœa.

"There is the strictest relation between the rapidity of the circulation and that of the respiration. The number of the pulsations of the heart preserves in all physiological conditions the same *ratio* to the number of respiratory movements." Carbonic acid is formed and evolved in proportion to the quickness of the circulation: "rapidity of the respiration is proportionate to the quantity of this carbonic acid so formed and so evolved."

The circulation varies in walking, quiescence, sleep, hibernation; but "the rapidity of the respiration is *proportionate* to that of the circulation in all these conditions."

That this statement is by no means absolutely correct, the able paper of Dr. Edward Smith, in the 'Medico-Chirurgical Transactions' for 1856 abundantly proves. Dr. Smith has shown that "the variation in the ratios, as noticed from hour to hour, on the average, is great and remarkable." For example, ranging from 1 : 3·8 to 1 : 5·7 in a child aged six, and from 1 : 2·9 to 1 : 4·0 in an adult aged thirty-nine.

The quantity of carbonic acid evolved is augmented with augmented rapidity of circulation; but if retained in the blood it poisons in proportion to the rapidity of the circulation.

Respiration is the exhalation of carbonic acid, and inhalation of oxygen. Drowning or strangulation stop both, but exhalation is of much greater immediate value to life.

"A mouse will *live* in an atmosphere of nitrogen and oxygen in which there is *so little* oxygen that a lighted taper is immediately extinguished, flame and spark; and *die* in an atmosphere of carbonic acid and oxygen, in which there is *so much* oxygen that a taper blown out, leaving a spark, is immediately re-inflamed. It is not the want of oxygen, but the excess of carbonic acid, which proves fatal." (p. 10.)

This statement, which has much for its support, and especially the experiments of M. Collard de Martigny, is not, however, free from objection. There are other facts which appear to support the view that the inhalation of oxygen is the more important element of the respiratory process. For example, those very careful observers, MM. Regnault and Reisset affirm: "Qu'une animal peut séjourner pendant longtemps et sans éprouver de malaise apparent, dans une atmosphère renfermant plus de la moitié de son volume d'acide carbonique, pourvu que cette atmosphère contienne une quantité suffisante d'oxygène." The experiments of MM. Regnault and Reisset differ, then, widely in their results from those of Dr. Hall, and, in fact, from those of almost all preceding experimentalists. But there was this important difference in their mode of conducting the operation—viz., that they continually renewed the oxygen in which the animals were placed.

The phenomena of "self-poisoning of the blood" from suspension of respiration have two phases, according to the condition of apnœa. If an animal is submerged in water, there are, 1st, voluntary efforts to escape; 2nd, stillness, or anæsthesia; 3rd, gasping; 4th, lingering circulation, but apparent death. If placed in a limited quantity of air, there are, 1st, natural breathing, unless excited emotionally; 2nd, panting; and 3rd, gasping. The anæsthesia depends on poisoning of brain; the "panting" on re-respiration of carbonic acid; "gasping" upon poisoning of the spinal centre—the latter being also indicated by open mouth, starts, tottering gait, and paralytic weakness of the posterior extremities.

These phenomena proceed with rapidity, inversely proportionate to age, temperature, degree of activity, and elevation in the zoological scale.

A lethargic bat submerged in water at 40° Fahr. was uninjured after sixteen minutes; a hedgehog submerged for twenty minutes recovered under similar circumstances; but these animals die as speedily as other warm-blooded animals if submerged in a state of activity.

> "Cases are recorded of the human subject being restored after many minutes of submersion. It might well be doubted whether the facts so recorded were correctly observed. But if they were, it must be supposed that a state of *syncope*, or of *shock*, must have obtained at the time of immersion, and the circulation have been reduced." (p. 13.)

This suggestion was offered several years ago by Mr. Erichsen.

Experiments are next adduced to show that the phenomena of apnœa chiefly result from the retention of carbonic acid. They are as follows:—1. A tame mouse, placed in two ounces of nitrogen, pants, gasps, and dies in five minutes. 2. Confined in ten ounces of nitrogen, it breathes slowly and feebly, but, removed at the end of fifty minutes, it recovered. 3. A wild mouse, confined in four ounces of nitrogen, pants in three or four minutes, gasps in three or four minutes more, but, transferred into eight ounces of fresh nitrogen, remains for thirty minutes, its respiration subsiding in depth and frequency; removed, it appears feeble, but is "lively" the next day, and died on the third day.* 4. A mouse, placed in two ounces of oxygen, breathed, panted, sighed, and gasped; but was removed alive after twenty minutes, and "these phenomena," Dr. Hall observes, "were exclusively those of carbonic acid." 5. A mouse, placed in a large quantity of oxygen, remained for three or four hours without injury.

These experiments have to us a somewhat different signification from that which they exhibited to Dr. Hall. The first three appear to prove that the concentration of carbonic acid in the atmosphere inspired is one condition of speedy asphyxia. The fourth experiment, taken in conjunction with the first, appears to show that the oxygen is of more importance than Dr. Hall supposed, and that it can, at all events, delay the phenomena due to carbonic acid; and the fifth experiment confirms this supposition. If the asphyxia effects observed in the fourth experiment were "exclusively those of carbonic acid," there were some other effects due to the oxygen; and these were most important, for the animal did not die in twenty minutes. That which was enclosed in an equal quantity of nitrogen died in five minutes, and it is probable that more carbonic acid would be formed and exhaled in the fourth experiment than in the first, the animal being in oxygen during the one, and in nitrogen during the other. The conclusion, therefore, appears to be, that the absence of oxygen—provided carbonic acid is in excess—is of more immediate detriment than the mere presence of the carbonic acid.

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* This condition, Dr. Hall remarks, resembles hibernation, and suggests for its explanation that nearly all the carbonic acid of the animal is exhaled, and oxygen being excluded, no further carbonic acid is formed.

Dr. Hall proceeds to consider, in the next sections, the influence of temperature and the warm-bath, showing, as the result of experiments by Milne-Edwards and Brown-Séquard, that within 60° and 100° Fahr. "the duration of life in suspended respiration is *inversely* as the temperature." The practical conclusion at which Dr. Hall arrived was, that in the treatment of apnœa the continuous warm-bath must be excluded. This inference is, we think, scarcely warranted by the facts. In the experiments alluded to, animals were completely submerged, so that there was no escape for the products of respiration, whereas in the use of a warm-bath there would not be this obstacle. And it ought certainly to be borne in mind, that the practice of the Royal Humane Society, whose rules, as Dr. Hall states, "may be summed up in one word—warmth!" has been eminently successful.

The importance of artificial respiration is so evident, and the readiness of Dr. Hall's method is so apparent, that we cannot but regret that its adoption should be interfered with rather than advanced by assertions such as the following:

> "This measure (the warm-bath) is perfectly useless, not to say injurious, unless artificial respiration be simultaneously administered; and this administration is incompatible with the posture implied by the use of the warm-bath. *To use the warm-bath is, therefore, to renounce the only hope, the only remedy, in apnœa.*" (p. 34.)

In the sequel, we shall see that, judged of by experience, such is not a warrantable conclusion.

The object of treatment in apnœa is, Dr. Hall continues, first to eliminate the carbonic acid already in the blood, and secondly to check its further formation, and for this purpose artificial respiration is *the* agent. Here follows the most important part of the work before us:

> "When the subject is kept in the *supine* position, events occur which render *every* attempt at inducing respiration absolutely nugatory: the tongue may fall backwards, carrying with it the epiglottis, and close the glottis or entrance into the windpipe and air-passages! Fluids already in the mouth or fauces, or regurgitated from the stomach, may not only obstruct the air-passages, but be forced or drawn back into the windpipe, and so add a *new* source of apnœa.

"These obstacles are obviated at once by reversing the position from the supine to the *prone!*" (p. 23.)

Experiments, first made by Mr. George Webster, are adduced to show that when the body is placed prone, inspiration and expiration can be readily produced and continued at pleasure by the mere exercise and relaxation of pressure, such alternations being easily accomplished by rotating the body from the prone to the lateral posture. Mr. Fox, Mr. Hunter, and Mr. Bowles (late of St. George's Hospital), performed further experiments, and, measuring somewhat roughly the quantity of air respired, found it sufficient. Rules for the treatment of persons apparently drowned or asphyxiated, are then given; but as they have been frequently printed, and are now familiar to all, we will not insert them. Dr. Hall then passes on to the consideration of "secondary apnœa," the "consequence of the poisoned state of the blood," which may show itself on the same, the second, or third day.

The portion of the work already epitomised constitutes Part the First, which "is nearly a verbatim reprint of the Essay presented to the Royal Humane Society in January, 1856." The report of the Society thereon is quoted at the commencement of Part the Second. Dr. Hall's rules, it is stated, were sent

> "To each of the Society's medical assistants, ... accompanied by a circular letter, calling on each to give his opinion on the proposed new method of treatment. Ten replies (the Committee reports to the Governors) have been received, including one from Sir Benjamin Brodie and one from Dr. Christian, M.D., Acting Surgeon to the Society's Receiving-House, Hyde Park, and from the preponderating opinions gathered therefrom, the Committee are advised to pause before adopting the new method recommended by Dr. Marshall Hall until it has been proved by the test of successful experience." (p. 46.)

We do not see that the Committee could have acted much more advisedly in the matter; but "the delay is homicidal," said Dr. Hall; "there is no need of a successful experience in a matter so simple; . . . . it is a question for unsophisticated common sense."

Now, at the close of 1857 (two years from the reception of Dr. Hall's essay), the directions of the Royal Humane Society hanging on the trees in Hyde Park, contain no hints at artificial respiration, nor any description of means, postural or otherwise, for its performance; whereas their fuller directions contained in the "report," advise a clumsy method, which requires apparatus for its performance, and is then often ineffectual. The terms used by Dr. Hall may not have been justified by the course which the Society adopted in 1856; but the continued neglect by that Society of the "ready method" is matter for grave censure. For, allowing that Dr. Hall's views upon the application of the warm-bath were to some degree theoretical, and contrary to the practice of the Royal Humane Society's agents—allowing that these views do require the "test of successful experience," that Society admits the importance of artificial respiration, and is without excuse for its omission now that a ready and safe method for its performance has been discovered.

In a subsequent portion of the second part of the volume before us, Dr. Hall refers to the experiments of Legallois in support of the position, that respiration is a cooling process, and especially so when out of proportion to the circulation; therefore it is urged that it should not be too rapidly effected, and that it should be accompanied by friction and upward pressure to increase the circulation. For, as increased circulation without respiration kills by poisoning, so increased respiration without circulation kills by refrigeration.

The new-born infant survives the absence of respiration longer than the adult, because, says Dr. Hall,

> "The excitability of the spinal system, and the irritability of the muscular system, exist in the highest condition, according to a law of animal life which I announced some years ago—viz., that these faculties are, throughout the animal kingdom, *inversely as the stimuli.*" (p. 56).

Dr. Hall then refers to those earlier researches of his which led to the production of two papers before the Royal Society, On the Ratio between Vital Dynamics and Stimuli, which, if they do not stand the searching scrutiny supplied by a more extensive zoology, are yet most interesting and instructive specimens of the mode in which a great mind reduced to at least temporary order and utility a vast array of apparently unconnected facts.

The practical inference drawn from this law, in the work before us, is, that efforts at the resuscitation of new-born infants should be more prolonged than in other cases, inasmuch as there is more hope of their recovery from suspended animation. Of this fact there is no doubt, whatever the true explanation may be. Dr. Hall has suggested the employment of a hot-bath as an *excitant* of respiration, its use being sudden, and alternated with that of another bath at a lower temperature.

In order to ascertain positively that the movements of rotation were sufficient to cause respiration, Dr. Hall devised a little instrument by which the quantity of air introduced could be measured. The gentlemen already mentioned as having assisted Dr. Hall, found that twenty cubic inches of air were exchanged by pronation and semi-supination; and that although alternate pressure and relaxation of the chest-walls, when the body was in a supine position, would sometimes effect a certain amount of inspiration, yet in other cases it failed, and that it was always more effectual in the prone.

Another suggestion in Dr. Hall's work is that the inhalation of pure ammonia may be of service in apnœa by combining with carbonic acid, and removing the latter as carbonate of ammonia. Two experiments are detailed: 1st. A mouse, enclosed in five ounces of atmospheric air, died in forty minutes; 2nd. Another mouse, confined in a similar quantity, but "into which pure ammoniacal gas was diffused," survived ninety minutes. Similar results have been obtained by Dr. J. W. Ogle and Mr. Lloyd Bullock; and Dr. Hall urges the employment of ammonia in cases of suffocation by charcoal fumes, the gases of wells, coal-pits, brewing vats, and also in secondary apnœa.

Is it possible that the refreshing effects produced by "Preston salts," "sal volatile," and other preparations giving off ammoniacal fumes, may be accounted for by this chemical combination with carbonic acid?

Further, Dr. Hall recommends the employment of postural respiration in narcotic poisoning, in the laryngismus of convulsion and epilepsy, or after paroxysms of pertussis, and in the laryngismus of strychnia-poisoning; and after giving some hints upon the prognosis in apnœa, brings forward numerous cases in support of the views advanced. These cases have already appeared in the medical journals, but some analysis of their contents will be of interest.

Twenty-nine cases are recorded, and of these eight are instances of drowning, one of asphyxia from the falling in of earth, one of narcotism, and two of poisoning by chloroform; the remainder are cases of still-birth.

In order to exhibit the value of the cases of drowning, we have extracted their more important particulars, and represented them in the following table:

Age.	Duration of submersion.	Commencement of treatment.	Previous treatment.	Condition when seen.	Result of Marshall Hall method.
2½	....	½ an hour.	Warmth and friction.	Occasional sob, or gasp with quiver; pupils dilated; no pulse.	In 40 minutes respiration established; recovery.
13	15 to 20 minutes.	Immediately.	....	Appeared quite dead.	In 15 minutes respiration; recovery.
Young man.	....	1 hour.	Warmth; friction; brandy.	Spoke after extrication; but blue, cold, and rigid, when seen; no respiration; no pulse.	In 12 minutes respiration established; recovery.
5	15 to 20 minutes.	A few minutes.	Warm bath; warm blankets.	Livid; pupils dilated; no respiration; no pulse.	No effect after 65 minutes; death.
32	? whether submerged at all.	Soon.	....	"Dead; in other terms, asphyxiated."	In 60 minutes respiration established; recovery.
7	5 minutes.	Just after.	....	Respiration suspended; action of heart inaudible; cold; livid.	In 30 minutes respiration; recovery.
11	5 or 6 minutes.	Directly.	....	Appearance, dead; livid; no respiration.	In 2 or 3 minutes some respiration; in 10 minutes regular respiration; recovery.
16	7 minutes.	Immediately.	....	Inanimate; no respiration; no pulse.	In 5 to 7 minutes respiration; recovery.

Here, then, are eight cases of drowning, the periods of submersion varying from five to twenty minutes. In six cases there was apparent asphyxia; in two, the symptoms were equivocal. In seven cases this method succeeded; in one it failed.

In order to estimate the real value of this method, let us compare the above results with the following, extracted from one of the earliest reports of the Royal Humane Society's proceedings. We have taken the first eight cases of drowning with regard to which anything more than the simple fact of recovery is mentioned in the report for 1783.

Age.	Period of submersion.	Condition.	Treatment.	Result.
8	10 minutes.	Apparently dead	Friction and warmth.	Recovery.
8	Some minutes.	Without any appearance of life.	....	Ditto.
4	20 minutes.	Livid; beyond hope	Friction.	Ditto.
17	....	Quite insensible; no respiration.	Ditto.	Ditto.
Young man.	20 minutes.	Hopes vain........................	Friction and artificial respiration.	Ditto.
Boy.	10 minutes.	Dead; cold; no respiration; no pulse.	....	Ditto.
Child.	10 minutes.	Livid	....	Ditto.
Gentleman.	10 minutes.	Cold; no pulse; no respiration; appeared totally dead.	....	Ditto.

Here, then, are eight cases in which the periods of submersion appear, if the statements can be relied upon, to have been protracted from ten to twenty minutes, and yet all recovered, the most prominent element in the treatment being friction, no allusion to artificial respiration occurring, except in one case.

The same report contains a more or less detailed account of sixty-eight cases in which the means recommended by the Royal Humane Society were successful; also thirty-five cases in which life was not restored; but in almost all instances in this second series, the periods of submersion were so long, when known at all, that any chance of recovery was precluded.

During the bathing season of 1856 there were forty-six cases of "drowning" in the Serpentine. The measures employed by the Royal Humane Society's agents were successful in thirty-five, the eleven unsuccessful cases being reported as "beyond recovery." The period of submersion is not mentioned in the report; but of the eleven fatal cases, six were instances of suicide, one "accidentally fell into the water," three were "exhausted while bathing," and one was "found drowned." It is therefore probable that in at least seven of the cases the period of submersion was considerably prolonged.

These facts speak for themselves; and we only add that, while fully appreciating the value of the "Marshall Hall method" of performing artificial respiration, we cannot but think that the cause of science and of true humanity alike demand that "the test of a successful experience" be applied to the method suggested, before it is made to supplant and exclude entirely that which has for many years passed the test, and which already numbers its instances, not by units, but by tens of thousands.

It appears, then, from the facts before us, that each of the two systems is attended by success. The Royal Humane Society directs its attention mainly to the circulation; Dr. Marshall Hall principally to the respiration; and as both functions are essential to life, it is evident that the restoration of the one does in many instances secure the activity of the other.

It seems probable that cases differ in their requirements, and that in dependence upon physiological peculiarities, external conditions, and the period during which apnœa has been continued, the reinvigoration of the circulation is of the greater vital moment in one, and that of the respiration in the other. These conditions of variation may be discovered by further experience, and be made the basis of operation, so that we may expect much from the judicious discrimination between, and the combination of, the two plans of treatment. There is nothing in the one which need exclude the other; warmth may be applied while postural respiration is being carried on; and thus combined, we believe that the "Marshall Hall method" will prove to be one of the largest boons conferred by its late and ever distinguished author upon both science and humanity.

REVIEW II.

1. *The History of Ancient and Modern Wines.* By Dr. HENDERSON. *London,* 1824. 4to.
2. *Traité sur les Vins de la France.* Par P. BATILLIAT.—*Paris,* 1846. 8vo.

Treatise on the Wines of France. By P. BATILLIAT.

3. *Beiträge zur Heilkunde.* Von F. W. BÖCKER. Erster Band. *Genussmittel.—Crefeld,* 1849.

Contributions to the Science of Medicine. By F. W. BÖCKER. Vol. I. *On Articles of Luxury.*

4. *De Wijn Scheikundig Beschouwd.* Door G. J. MULDER.—*Rotterdam,* 1855. 8vo.

Wine Scientifically Considered. By G. J. MULDER.

5. *The Chemistry of Wine.* By G. T. MULDER. Edited by H. BENCE JONES, M.D.—*London,* 1857. pp. 390.
6. *Wine and Spirit Merchants' Own Book.* By C. C. DORNAT.—*London,* 1855.

A FEW years ago, if a physician, curious *bon vivant,* or ambitious merchant desired to know, for the sake of his patients, his palate, or his pocket, the difference between one wine and another, he got little help from his chemical library. He learnt the various quantities of alcohol contained in the several sorts, and scarcely anything else. Hence some physiologists and medical men concluded that wine really was only diluted alcohol, that spirits and water was just as useful or hurtful as the true gifts of Bacchus, and that to make distinctions was merely pandering to an expensive fancy. Others more shrewd have fallen back on personal experience alone as their guide, and steer as well as they can by its uncertain and limited light.

A knowledge of the amount of alcoholic contents of a wine will indeed enable us to give a rough guess how much a man may drink without its getting into his head, but not even that with sufficient certainty to be of practical use; for some wines poor in spirit, have a bad habit of rapidly fuddling the brains; whilst others are so constituted as to accomplish the physician's occasional wish of conveying into the system, without intoxication, a large amount of alcohol. We know, too, that alcohol is necessary to the preservation of wine, and there is a minimum quantity, beneath which the amount of it cannot sink, without the liquor being subject to decomposition inconveniently rapid. But this quantity varies in different wines, some sorts requiring much more than others. We may, then, fairly be discontented with the information solely derived from the alcoholic contents. We want to know how wine will taste, how it will keep, what price it will fetch, what effect it will have upon our patients, and we are often puzzled to know whether it is wine at all: and in clearing up these mysteries get no help from alcoholometry.

The advances made by the present generation in organic chemistry, lend a hope of throwing more light on the subject than could have been done by science at the date when Dr. Henderson published his invaluable work, still the classical authority with all who know it. The easy taste of its style, the beauty and number of its illustrations, the accuracy and good selection of its quotations, not to mention its convenient type and division, must render it an universal favourite. But its chemistry, though rarely wrong, is of course not that of 1858. We think the time has come for reviewing what since then has been done, and is doing, by scientific research, and examining how far that is capable of practical application.

How shall we arrange the topics on which the advance of science ought to make us better informed, or at all events more easily and systematically informed, than our fathers? An orderly rehearsal of the several constituents elicited by chemists would weary our readers, and offer more show than reality of improved science. To trace the noble juices from their birth in the grape, through the vat into the cask, from the cask into the bottle, and from the bottle into the human frame; reviewing what can be learnt of the changes they undergo in fermenting, casking, bottling, cellaring, and drinking, would indeed be an interesting task, but too lengthy for our pages, and rather suited for industrial than medical application. A more convenient method will be to take in order the several points mentioned just now as not elucidated by the estimation of the alcoholic contents, and to see how far modern chemistry will aid us to have clearer ideas concerning the *flavour*, the *changes by age*, the *value*, the *medical uses*, and the *adulteration* of wines.

The FLAVOURS of wines may be considered to depend on their—1. Free[*] Acids; 2. Sugar; 3. Tannin; 4. Volatile Ethers, or "Bouquet;" 5. Non-volatile Extract, or "Body."

1. *Free acids* are found in all wines and in less variable quantities than perhaps might be expected. Thus Mr. Gunning,[†] acting apparently under Professor Mulder's directions, found in 100 grammes (= $3\frac{1}{2}$ imperial fluid-ounces, or about a couple of glasses)

	English grains[‡] of acid.
Of Sauterne	$4\frac{1}{2}$
„ Port	$5\frac{4}{5}$
„ Lachryma Christi	7
„ Champagne	$7\frac{3}{10}$
„ Bordeaux ordinaire	
„ Madeira	
„ Beaune	$7\frac{4}{5}$
„ St. George	$8\frac{3}{10}$
„ Hock	$8\frac{2}{5}$

And so on through many less familiar vintages, none seeming to have less than $4\frac{1}{2}$, or more than 9, grains of acid in the two glasses.

How is it, then, that our connoisseurs pronounce some wines "not acid?" How is it that we do not taste in all sorts this large amount of decided flavouring?—Simply because it is masked by sugar more in some than in others. Everybody notices a degree of tartness in even the finest Chateau Yquem Sauterne, yet its acid constituents are less than those of port, where they are undiscoverable, or of champagne, which is pronounced "sweet." This is almost entirely explained by the total absence of sugar from the first, by the presence of about twenty grains per ounce in the second, and of still more in the third. Who would have guessed that Lachryma Christi was in reality nearly as sour as ordinary claret? Yet such it appears to be by the table above drawn out from Gunning's experiments. It is clear that almost any amount of acidity may be concealed from the taster by sugar.

The effect of acids is doubtless to render the gustatory nerves more susceptible of other agreeabler savours. Wine neutralized by soda is sad mawkish stuff, and acidulous fruits are always the most delicious. But it also prevents the sugar from palling the palate, enables more to be borne in the liquor, and thus the peculiar advantages of the saccharine constituents to be enjoyed in larger proportion. There is also every reason to believe that the acid unites with other constituents of the grape, to develope during age those fruity ethers which are the chief attraction to the purchaser.

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[*] Under the head of "*free* acids," the moda of analysis employed includes the acid equivalent of cream of tartar.

[†] Changed in the German and English translations into "Güning."

[‡] We have reduced the weights and measures to the British standard; and we take this opportunity of wishing that all translators would do the same. Persons who shrink from the labour of reading French and German, have an equal objection to be puzzled with centigrade thermometers, cubic centimetres, loth, maass, milligrammes, &c. It may be remarked that in Dr. Bence Jones's translation of Mulder, the value of the gramme is wrongly stated—viz., as 15·49 instead of 15·43 grains.

There is a marked difference in wines as regards the *sort* of acid found in them. Some interesting analyses of the chief wines in the London market, published by Dr. Bence Jones,[*] are much diminished in value by all that which neutralizes caustic soda being reckoned as "tartaric acid," instead of being classified as it ought to be under several heads. We may indeed set aside traces of malic acid (in Bordeaux), of citric, glucic, formic, and lactic acids, as probably due to some eccentric experiments of the manufacturer or merchant. But leaving them as unimportant, we come to racemic[†] as certainly found,[‡] and to acetic and tartaric acids as capable of having their quantities estimated in various wines. The proportion of the two is by no means a matter of indifference, for it appears that the former of those whose amount can be reckoned, is much more capable than the latter of developing the attractive flavours. Madeira, when young, with a medium quantity of acid (see the table given above), is yet a high-flavoured wine, because the acetic is to the tartaric as 1 to 2; whilst in the unpopular Tavel it is only as 1 to 23.[§] In Port, the proportions are as 1 to 3; and the consequence is, that with a smaller quantum of acidity it is yet fuller-flavoured than Beaune, where the proportions are as 1 to 12. Now, the object of the consumer being to have a maximum of flavour brought out by a minimum of acidity, it appears a real step in knowledge to find that acetic acid rather than tartaric conduces to this result.

2. *Sugar* has been mentioned above as useful in rendering vegetable flavours more appreciable by the palate. Where, then, these flavours are naturally poor and weak, it is essential that a large quantity of sugar should exist in the wine, or it is tasteless. Now, as an almost universal rule, it may be observed that the grapes of warm climates are wanting in higher kinds of flavour, and therefore, that unless they are well ripened, and rich in sugar, the wine produced is of the worst possible quality. This is the case with the inferior Peninsular and Italian growths, which are never fit for exportation. All the better sorts which come into foreign markets—Port, Madeira, Sherry, Lachryma

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[*] Proceedings of Royal Institution of Great Britain, &c.

[†] Racemic (or paratartaric) differs from tartaric acid in containing the additional quantity of hydrogen and oxygen equal to two equivalents of water. Tartaric=$C_8H_6O_{12}$; racemic=$C_8H_8O_{14}$. Its chief interest as regards the present subject is, that it is as sour as tartaric acid, and may be formed by the decomposition of tartaric ether, which is much less strong in flavour. It may therefore help to account for the acidifying of some wine by keeping, where the alcohol, being undiminished, has evidently not formed vinegar. On the origin of racemic acid, see the Comptes Rendus de l'Acad., xxix. p. 526; and Gerhardt, Chimie Organique, vol. ii. p. 11.

[‡] Mulder, p. 205.

[§] Gunning, in Mulder, p. 202. We may as well mention here that we found it impossible to use Dr. Bence Jones's translation of Mulder, on account of the numerous blunders, not only in proper names, but in numbers. The queen of wines, for instance, is cruelly used; she is sometimes spelt Madera; the very first average of her acid contents is wrongly struck; and 310 milligrammes printed instead of 102 as the quantity of acetic acid contained in her. 2·93 for 2·98, 225 for 255, 90 for 20, 12 for 11 parts, are instances almost equally puzzling in their place.

Christi, and the like, are full of sugar. Fortunately, the same warmth of climate which has a deleterious influence over flavour, is favourable to complete ripening, and therefore (under proper farming) to the formation of sugar in the grape, so that at least a sound if not a delicate wine may be made.

On the other hand, where the vine attains its extreme northerly limit, it develops its richest aromas, and on the Rhine and Moselle we find wines which are almost perfumes. But at the same time, the must is so poor in saccharine constituents, that there is only just enough to produce the alcohol necessary to keep the wine. We do not miss the sweetness, for there is enough flavour to be tasty without it.

There seems a little doubt whether or no any wines are entirely free from sugar. Dr. Jones was unable in any of the Rhine, Moselle, Burgundy, or red Bordeaux, which he examined by Soleil's saccharometer, liquor potassæ, and sulphate of copper, to detect even a trace.* Whilst, on the other hand, Professor Mulder says that one-half per cent. is absolutely necessary to the flavour of red wines; and Fischern, Fresenius, and Diez found it in fifty sorts of Rhine, Moselle, and Ahr wine, some (e.g., Rieslinger) containing as much as 3·5 per cent. And Kersting found sugar in seven specimens of wine from the Bergstrasse.† Perhaps cellaring may convert it into alcohol; perhaps the German chemists may have mistaken the reactions of albumen on copper for those of sugar. The determination of the point has no practical value for the present question, and we may patiently wait till the chemists have settled it, for it is clear enough that *little or none* of this substance is to be expected in the wines of the more temperate climates, and *much* in those of the warmer.

The way in which wines come to be sweet is various. In the more perfect, such as the best Port and Madeira, the ripe grape is so rich in sugar, that the excess checks the fermentation before the whole is converted into alcohol. In others, such as Tokay and Malaga, part of the must is boiled down to form a stock of extra sugar, to be added for the same purpose. In other cases, the sugar is gained by allowing the grapes to hang on the vines till almost converted into raisins. In the many nameless vineyards which furnish the cheaper imitations of the above-named prime wines, cane-sugar and potato-sugar are added to the genuine juice during fermentation, at the discretion of the manufacturer; or alcohol is added in the shape of brandy, so as to check the further progress of the chemical changes. Of the artificial methods, the two former involve a loss of quantity, and therefore justify an addition of expense; the latter are dilutions of the peculiar constituents of the grape, and if designed for purposes of deception, are of course fraudulent.

3. *Tannin* does not exist in grape-*juice*, but is abundant in the skins, stones, and stalks. Its introduction, therefore, is purely voluntary, and is intended partly to assist in the preservation of the wine,

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* Proceedings of Royal Institution.

† The analyses are quoted in Mulder, p. 145 et seq.

as will be explained further on, and partly also to give a masculine roughness of flavour which prevents the palling of the palate. The greatest quantity of tannin is contained in the skin of dark purple grapes, and consequently the wines fullest of it are those which are made from such fruit, as Port, Burgundy, and Bordeaux. But, as aforesaid, the quantity of it is purely voluntary on the part of the manufacturer, and there may be made from purple grapes, wines of various shades of red, and even white wines;* only it must be remembered that the tannin will diminish in an equal proportion. As a rule, then, let not customers who dislike a rough wine, insist upon a full red colour, for if they do, the merchant must introduce some artificial dye-stuff. Also let them not suppose that roughness is an evidence of adulteration or badness; if joined to other full qualities, it may be a proof of the anxiety of the farmer to preserve virtues which will increase by age, and so be an index that there is latent good in the wine.

4. There is present in all wines a peculiar characteristic odour, a "vinous smell," not due to the alcohol, or to the sugar, or to the acids, for we may separate them, and they do not smell of it. At the same time it does not exist in the grape, for the most delicate organs discover there no trace of it. It is familiarly called "bouquet," not because it is like flowers, but because it is diffused from the bottle as from a nosegay. A poetical proverb has compared it to a "sunbeam," so pure, so delicate, so intense, so transient a joy. We look to chemistry to give us a more distinctive name, and to elucidate in some degree the nature of this substance (if, indeed, it is one substance), which is present in all wines, and appears complete nowhere else except in wine.

It is strange, but appears nevertheless to be true, that the substance to which the production of this delicious odour is mainly to be attributed, is itself fœtid. The subject has had more light thrown upon it by the investigation of what are called "foozle oils," than from any other source. These are well known to all persons familiar with the distillation of spirituous liquors, as unfortunately coming over with the alcohol, and causing much trouble and expense by the necessity for freeing it of them. A small quantity is bearable; it is malt or potato foozle oil which gives the peaty taste to whisky: the foozle oils of grape, musk, and grain, flavour brandy; but nobody could drink either of these unless partially purified. The flavour of spirits derived from the extremely minute quantity of foozle oil in them is so strong, that their presence in adulterated wines can often be thus detected. The place of foozle oil (hydrate of amyle) in spirits, which, fœtid in mass, is agreeable, at least to spirit-drinkers, in minute doses, is taken in wine by œnanthic ether, equally fœtid when isolated, yet apparently the main agent in the elaboration of the delicious bouquet.

Let it not be understood that œnanthic ether *is* the bouquet. By no means; but it contributes to give a *vinous* smell (there is no other more accurate way to describe it), and to *bring out* the bouquet—just as musk, itself undetected, intensifies the odours of eau de Cologne and lavender water, or as garlic is used by crafty cooks to render dishes savoury. It differs from all the other ingredients in the products of grape fermentation by being found nowhere else, and is not capable at present of being manufactured in any other way than either from wine or its lees. What, then, is œnanthic ether? It arises from the action of œnanthic acid upon alcohol; just as the action of butyric acid (sour cheese) upon alcohol produces the fragrant butyric ether (the "pine-apple flavouring") of our confectioners.

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* For example, Champagne is made from a purple grape by separating the skins.

To go one step deeper, then, what is œnanthic acid? It is a substance, coming nearest in its chemical constitution to those component parts of natural oils commonly called "fatty acids," familiar to us as margarin, stearin, and palm oil. It is a colourless, scentless butter, which reddens litmus, is soluble in alkalies, ether, and alcohol, and melts at a temperature of 56° Fah. It is so nearly identical in composition with an oil obtained by distilling geranium leaves, that some chemists (especially Delffs) maintain that they are the same. But it differs in this, that it decomposes at the heat necessary to distil it, parting with its equivalent of water; whereas the pelargonic acid from the plant above named distils over unchanged.* Whence comes this important oil to convert the nascent alcohol into the true vinous flavour? Is it pre-existent in the vine, or a product of fermentation? Now, grape-*juice* contains no oily or waxy matter of any kind, so it is certainly not there. But, on the other hand, grape-*skins* do; it may be seen in the shape of "bloom" ornamenting their outsides during life, and by boiling them in alcohol a considerable quantity of white wax may be obtained, which may be precipitated from the alcohol by water. And grape stones contain still more, so much, indeed, as to burn with a bright flame, and to have attracted the attention of economists, who have proposed to extract it for food and for light.† There is therefore abundance of oleaginous matters in those musts in which the stones and skins are bruised, and chemists are now, we believe, at work examining them, to try and find this identical oily acid *in propriâ personâ*.

If, however, the chemists are unsuccessful in finding it in any part of the plant, there is still the process of fermentation itself to fall back upon before they confess themselves at fault. Vegetable and animal physiology afford several examples in which fat is formed from sugar. The butyric acid just mentioned, is easiest made in large quantities by inducing "butyric fermentation" in sugar with a small quantity of rotting cheese. In nature, too, wax is formed by bees furnished with honey alone; oil is produced from the sweet juice in the ripening olive; animals fed on starch alone get plump; a waxy matter often replaces the true produce of the sugar-cane during life, and after being gathered, the canes sometimes undergo a waxy putrefaction. It is not therefore impossible that œnanthic acid may be a product of fermentation by being formed from sugar.

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* Gerhardt, and authorities quoted by him, Chimie Organ. ii. p. 751.

† Bender, of Coblence, expressed about five pounds of oil per hundredweight from waste grape-stones; and M. Roy calculates that 5400 tons of oil are thus annually thrown away in France. But unfortunately the expense of pressing amounts to five times the value of the article obtained.—Verhandl. des Coblentzer Gewerb-Vereins, 1836.

Œnanthic ether is not the only odorous ether found in our cellared treasures. Indeed, *alone*, it is not sweet-smelling, as before explained; and even when only abundant, as in young wine, without being actually isolated, is disagreeable to the senses. But it is placed first, because it is invariable, whereas the rest are developed by its presence, some in one wine and some in another. When acetic acid occurs, it has been already mentioned as being a great improvement to the flavour. This improvement appears to be owing to the gradual formation of acetic ether by the slow action of that acid upon alcohol. So well known in the market is this fact, that acetic ether is sold in considerable quantities to add bouquet to second-class wines. Tartaric ether is also produced by the same action of its paternal acid upon alcohol, but unfortunately it is scentless, and almost tasteless. The same reproach cannot, however, be applied to the ethers of the fatty acids; butyric, caproic, caprylic, and capric acids evolve butyric ether, with its pine-apple fragrance—caproic ether, having a smell compounded of the melon and golden pippin—caprylic, also pine-scented—and capric, a peculiar fragrant liquid, found by Rowney in the foozle oil of potatoes. These, again, may form compounds—such, for example, as the acetate of capryl, stated by Professor Mulder to have a wondrous fragrance. The formation of these is easy and natural when an oxide of ethyle is once developed in the wine, and when the special fatty matters which go towards their composition have been, accidentally or intentionally, by the teaching of tradition or science, introduced into the grape juice.

All that has been said of ethyle might be repeated again as regards its cogeners—amyle and propylene, which form various fragrances with various acids. Many of these are capable of being isolated, and are already manufactured on a considerable scale for economical purposes; and almost monthly the chemical periodicals announce the name of some new kindred substance, sometimes very sweet, sometimes very fœtid, and sometimes with that ambiguous sort of odour which you do not know whether to denounce as very nasty or very pleasant. But whatever their character, it is almost always in extremes, and seeming to increase in intensity by diffusion. We do not mean that their power is (like the Hahnemannic globules) in a direct ratio to the smallness of the dose, but that one drop goes very much more than half as far as two drops.

This property of diffusion did not escape the notice of the ancients; and consequently they mixed their wines, which are well known to have been very strong,* with a large quantity of water, not for the sake of temperance, but of enjoyment. Homer says of the wine which Ulysses gave the Cyclops, that he who would appreciate its fullest bouquet (ὀδμὴ ἡδεῖα θεσπεσίη), mixed it with twenty times its volume of water.[*] This is not a poetical license, Homer rarely exaggerates in matters of daily life, for we find Hippocrates, several centuries afterwards, diluting Thasian wine with twenty-five volumes of water for fever patients.[†] Wine-bibbers would do well to lay this to heart: when you have your liquors as strong as the ancients did, dilution is agreeable to a pure taste, as well as prudent.

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* Professor Miller, in a foolish essay on 'Alcohol, its Place and Power,' grounds an argument on the assumed notion that the wines of the ancients were very *weak*! Fancy diluting weak wine with twenty-five volumes of water, or storing weak wine for a century or so! This is of a-piece with the theology of the same work, which supposes that had our Divine Master lived now, he would not have sanctioned wine at a wedding-feast, or (we presume) have drank it at the Passover; and with the pathology of a few pages previous, where an abstract of a popular novelist's sketch of a spirit-drinker's combustion is given, with a note that "examples of this fearful ending are by no means rare."

It is remarked, that if grape-juice be carefully purified by filtration through charcoal, it will indeed work as actively as usual, and form alcohol, but the resulting wine will have not a particle of bouquet or aroma. This favours the idea that the fatty acids are not the product of fermentation, but are derived from the oils of the skins, stones, or stalks—in fact, that what ignorant spectators look upon as dirt in the vat, is necessary to produce the most valued virtue in the wine. Perhaps the reason why Anglo-Saxons are not generally successful as *vignerons* is that they are too cleanly.

Besides the ethereal bouquet derived from the action of the just-described substances upon alcohol, and consequently wholly posterior to fermentation, and not to be found in the grape juice, there is present in many wines a spicy sort of taste, technically called "aroma." There is not much of it in pure Rhine wines, but as we get further south the more distinct it becomes. This is coincident with the fact that Rhine grapes have scarce any smell, whereas, as the climate improves, their odour is more and more conspicuous. The aroma, then, is obviously something which survives fermentation, and there seems sufficient reason for considering it as of the same nature as the essential oils of fragrant plants. Indeed, where this aroma is absent from the grape, as in the Rhine and Moselle districts, odorous vegetables are employed to communicate their peculiarities to the vintage. The flowers of the lime and the elder, the leaves of the meadow-sweet, quince peel, sage, and centaury, are mixed with the fermenting must. Violets and orris-root are employed to make second-growth Bordeaux equal to the first. In the manufacture of sham Madeira, Sherry, and Port, elder and lime flowers, cashoo and carthamum, are infused in the mixture. And vine-flowers gathered in full blossom, dried and powdered, are recommended as an excellent receipt for meliorating spoiled wines.[‡]

5. What is technically termed "body," consists in a great measure of sugar, which we have already discussed; but besides this, there is also gum, extractive, and a certain quantity of albuminous matter which has survived fermentation. These separately have not much taste, but still both individually, and more when united, have considerable power in modifying the over-marked flavours of some of the other ingredients. Their influence in giving taste is greater as regards the future than the present of the wine. Their medical importance will be spoken of afterwards.

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[*] Hom. Od. ix. 208.

[†] Hippocr. On Diseases, b. iii. last chap.

[‡] Wine and Spirit Merchants' Own Book, pp. 12—32.

We come next to consider the CHANGES BY AGE which wine undergoes. In such a complex organic mixture chemical rest is impossible, and there is probably no single moment at which wine is not altered for the better or for the worse from the time of its birth in the vat. Like all organic mixtures, it is born to die and decay, but as a first operation of that which afterwards constitutes its death, it may acquire properties which render it more agreeable to the palate, and more beneficial to the health of the consumer. This result is aimed at by judicious *cellaring*.

The first alteration for the better consists in the *loss of water*. This happens while the wine is in the wood, by evaporation through the cask. Doubtless some alcohol escapes at the same time, but in proportion more water, as is shown by the experiments of Sömmering, repeated by Dr. Graham, in which dilute spirit put into bladders became stronger by keeping.* Good cellarers are careful to repair this loss by filling up the casks with wine, so that hereby all the constituents of wine, except water, are increased, and the article becomes both stronger and higher-flavoured; for the component parts, being more concentrated, act chemically on one another with more energy, and develop the expected flavours more fully. If, however, the deficient space in the cask is not refilled, air gets in, much of the alcohol becomes oxidized into acetic acid, and though a fine ether may be thus generated, yet an unnecessary amount of sourness is produced. Thus, for instance, the old plan of sending Madeira backwards and forwards to the East or West Indies rapidly evaporated it, and produced a finely-flavoured, but very sour and unwholesome wine; whereas a few more years in a warm cellar and continuous refilling would have elicited the same taste without the acid.

Up to the time, then, of being drawn from the cask, wine gets continuously stronger; but once bottled, no increase in alcohol takes place. True, the alcoholic contents of old wine is large; but the fact is, they have been kept long because they were strong: they are not strong because they have been kept long. Sugar could not turn into spirit without an evolution of carbonic acid, which is never found in old wine.

Almost any wine may be improved by keeping in the cask, if care be taken to refill it; but only the very best will bear the neglect of this precaution, and even they will not improve so much as they might do under more prudent management.

A more important change than concentration, is the gradual *development of the ethers* before described. To have them in all their varied perfections, time is absolutely necessary. The nobler wines are as long in attaining full growth as the nobler animals. The birth of Horace and of the wine he has immortalized were in the same year ("*O nata*

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* Chemical Gazette, 1854, p. 420.

mecum consule Manlio," &c.), and it is not uncommon for young men to drink from bottles much senior to themselves. But for those who are satisfied with something less than this, the process may be much hastened by the universal chemical quickener, heat. The Romans kept full-bodied wine up the chimney or in a warm garret: we send our Madeira to the tropics, or have a cupboard made for it at the back of the kitchen fire. In the palatial warehouses of Bordeaux, where King Claret reigns over willing slaves, you see a centigrade thermometer every few yards, to provide within the fraction of a degree for the maintenance of the highest mean temperature proper for the age of the vintage. By these means you may secure for yourself fruit which would otherwise have ripened only for your children.

By those who are in a still greater hurry, the following less familiar process may be adopted from the 'Wine and Spirit Merchants' Own Book.'

> "*To make new wine taste old.*
>
> "Take good old wine; mix it with new wine of the same colour and quality, about the twentieth part of old wine to every quart bottle of new. Put the bottles in a copper filled up with cold water; keep it boiling for about an hour; let it cool, and the whole liquor will be in taste and appearance perfectly equal to the old wine."

The last clause we would take leave to doubt, and should drop a tear over any really prime wine which had been crammed for its examination in this way. Still, if a man has nothing to offer a guest but new wine, he may be allowed to ripen it thus; only, instead of boiling-point, we should advise a lower temperature—say from 180° to 190° Fahr., and a longer exposure to it. Young wine is often much improved even by placing it before the fire till the chill is taken off, without heating it so much as to make an after-cooling requisite. But nothing is gained by warming ripe wine—indeed, the ethers already formed are apt to be driven off, and the taste injured. Learn, then, from science, to warm your young and keep your old wine cool; learn, too, not to warm more than is wanted for immediate drinking, for if wine thus artificially forced be returned to the cellar, all future changes will be in a retrograde direction.

The insertion of a few drops of acetic or any of the other flavouring ethers into the decanter, is also fair enough. Only do not expect more than an *imitation* of the natural production, and be careful not to overdo it.

The elaboration of the mixed ethers is the main reason for storing wine, and it probably will always come under the same law which affects all social life, that everything truly good must be waited for and paid for.

Some wines become "*sweeter*" in bottle. It may be doubted whether their sugar increases by the decomposition of organic hydrocarbons, as some have suggested. The probability is that the sweetening arises from the diminution of the tartaric acid, which has gone to form tartaric ether.

These, then, are the three objects aimed at in cellaring wine—concentration, etherizing, sweetening. To attain them — that is to say, to make wine keep till they are gained—certain modifications of manufacture are adopted. These, again, give birth to changes more apparent to the eye than to the palate, and are rather tests of improvement than improvements themselves.

Under this category come *changes in colour*. It is found by experience that some vineyards—such as those of Burgundy, Medoc, and Portugal—produce a finer liquor if a certain quantity of albumen survives the fermentation. But alone, this albumen would too rapidly decompose, so by throwing the purple skins into the press, tannin, mixed with the colouring matter is added to the must. Thence comes out a red wine in which the tannin preserves the albumen. The albumen does its work by acting as a continuous very slight ferment to the ethers, but in due course of time gradually unites with the tannic acid, and being insoluble, is precipitated along with the colouring matter in the form of crust. Hence all red wines become pale, and their becoming pale is an evidence that the ripening ferment is gone from them; they may get worse, but they will never get any better.

Red wines, however, do not become colourless, but "tawny." This is from the presence in them, as well as in not red wines, of *extractive*, a substance pervading more or less all the vegetable world, and whose most notable quality is, getting brown by age. It is the colouring matter of oak and mahogany, which we see darken by years; and it appears in the unripe horse-chesnut, which is white when the peel is first broken, and turns to a burnt sienna in a few moments. The same substance which gives a venerable appearance to the hereditary dining-table, *ought* to be the colouring ingredient of the old Sherry and the old Steinberg set upon it.

But it does not become more than brown. When Martial speaks of white Falernian as black with age, he is either exaggerating, or it must have got sooted in the *fumarium*.* Neither the famous "Rosenwein" of the vintage of 1624, in the keeping of the corporation of Bremen, nor the Mountain buried in the fire of London, and dug up 160 years afterwards, are described as black.†

Besides these changes for the better, there are many changes for the worse, which if they occur after maturity, may be considered as

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* Martialis, Epigr. viii. 56, xi. 9—50, &c. Some have supposed the epithet to mean a dark purple hue, like that of Virgil's "*nigræ* violæ" and "vaccinia." But nobody would speak of *old* red wine as dark with age, for it is sure to be tawny, which none knew better than Martial. The medical writers, Oribasius and Aurelian, respectively describe Falernian as "fulvum" and "album." Driven to despair by the conflicting epithets of the Romans, we fly to a Greek, and there find an explanation of the whole matter. Galen, quoted by Athenæus (Deipn. i. 48), says that ordinary Falernian was, like the modern, yellow (κιῤῥὸς); but that in harvests got in with a south wind, it was dingy or smoky (μελάντερος), like very choice Steinberg. This is the colour which Martial has exaggerated, so much to the confusion of commentators.

† Dr. Henderson (On Wines, p. 321) seems to consider the Mountain above mentioned (or, as Dr. Mulder calls it, Malaga) as the oldest alcoholic liquor on record in good condition. But he omits to notice the Rosenwein of Bremen; and lately that has been surpassed by a cellar dug up in the island of Cyprus, where was some wine left there by the Knights on their expulsion in 1570. Mr. James Hamilton reports it as very sound and fine.

decrepitude, if prematurely, as *diseases* of wines. Some of the most common may be quoted as instances.

The most destructive of these maladies is that technically called *the rot* (*le poux*). It is announced by loss of red colour, by loss of taste, and loss of odour, or rather the substitution of nauseous tastes and odour for the natural bouquet. It begins from below, and therefore is not, like the disease next to be noticed, an oxidation from without, but an internal decay. In which of the constituents it is first set up, is certainly a question of much importance to those endeavouring to arrest it, but it is unfortunately still *sub judice*. M. Batilliat thinks it begins in the azotized colouring matter, which he calls "pourprite," and he has in support of his opinion the indubitable fact that red wines are chiefly subject to it, and also the general law that decay does commence generally in such compound nitrogenous bodies. Professor Mulder says that this is to take the effect for the cause, and attributes the beginning of the rot to the decomposition of bitartrate of potash into carbonate; but he does not give any reasons for his *dixit*, and he has against him the infrequency of the disease in Chablis and Rhine wine, which contains more tartar than any other.

At the stage of decay above described, the spirit is intact, and the wine may be distilled into very good brandy. But soon the alcohol begins to be oxidized into acetic acid, and the more destructive disease called *souring* commences. This goes on gradually from above downwards, till the whole is converted into vinegar, and the longer decisive steps are delayed, the less spirit can be saved.

The rot and souring are most ruinous occurrences to the wine-merchant, and we cannot therefore be surprised that a variety of plans are extant for arresting them. The most obvious agents to employ for this purpose are those which have the property of stopping decomposition in other cases. Sulphurous and sulphuric acids have been used, as also alum; and where the wine is so far gone as to be fit only for distilling, they are by no means objectionable, and they will preserve the alcohol till there is a good opportunity for disposing of it to the distiller. But we must protest against their employment in the modes advised in the 'Wine and Spirit Merchants' Own Book,' where both sulphurous acid and alum are prescribed for mixture with liquids intended for the table. As they must remain in the wine in considerable quantities, they cannot fail to be both nauseous and unwholesome. The same objection does not lie against the plan adopted by M. Batilliat, by which the evil is taken away without any foreign mixture being afterwards retained. He adds to the turning wine a large quantity of tartaric acid, which unites with the free carbonate of potash to form insoluble cream of tartar, and be rapidly deposited as a sediment. When this is removed, the wine is impoverished indeed, but still fairly wholesome and unadulterated. To complete the cure, it requires to have some good coloured wine added to it, and to be strained.*

The *grease* of wine is the conversion by a kind of fermentation of the sugar into a ropy, oily mass consisting of lactic acid, mannite, and vegetable mucus. It has been called "mucous fermentation," and may be produced in the laboratory by keeping sugar and yeast at a temperature of from 80° to 100°. It probably, therefore, is due to some tricks having been played upon the wine by heating it to induce an artificial ripeness, or by too rapid fermentation. The presence of tannic acid prevents it, and M. François, of Nantes, advises the use of that substance, or of bruised crab-apples, as a cure.

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* Traité sur les Vins de la France, p. 135.

Fungous vegetables may grow in wine. A great incentive to this is excess of tartaric acid. Solutions of tartaric acid in the laboratory are constantly getting mouldy, and the same result not unfrequently takes place in light wine too long casked. When bottled, there is an additional element of decay in the cork, which in an ill-ventilated cellar may often be seen covered outside with a crop of mould. This spreads inwards, and in course of time infects the contents, which are then said to be "*corked*." There is no more common disease in cellars than this, and excellent wines are often spoiled by it. The remedies are,—1st. If possible, ventilate and dry your cellar. 2nd. Re-cork all the bottles not intended for immediate use. 3rd. Cut your corks close off, and resin their tops. 4th. As the disease is a purely local one, it often has not extended beyond the surface of wine in immediate contact with the cork, and hence the rest of the bottle may be saved by pouring off a few spoonfuls.

Bitterness is a disease almost peculiar to Burgundy. It seems to arise during a second fermentation, as carbonic acid is evolved; and the peculiar taste is ascribed to citric ether, which is bitter. But, as Professor Mulder remarks, where is the citric acid to come from? As occurring in a wine which possesses a domestic interest for M. Batilliat, he goes very fully into the question of bitterness, but as wine so affected will rarely come into a foreign market without being so mixed and sophisticated as to be incurable, we will not affect to care much about it.

> "Whatever diseases may befall wine, the cause of them lies in the presence of matters which are capable of decomposing and of communicating decomposition to others. It is not necessary to pursue our investigations further, when we find here a certain quantity of the same constituent which has changed the saccharine juice into wine, and of which a small portion is left behind after fermentation. In all wines there is generated an albuminous body. This will, under some circumstances, directly make the wine 'sick;' under other circumstances, originate indirectly different diseases: but as a rule, it will slowly improve the liquid, and develope in it from the other constituents matters of agreeable taste and smell. These albuminous bodies are the springs of movement in organized nature, as much in their birth as in their death, as well in the living plant as in its products. They rest not before they are themselves annihilated, and there fall into annihilation with them, fortunately or unfortunately, as the case may be, other joint constituents of the body they form part of."*

It is very obvious from the general principle thus strikingly put forward, that a capacity for improvement implies also an equal capacity for disease, unless it be counteracted in some way. And the object is to find a mode of management which will enable wine to be preserved long enough to develope its full virtues without arresting those interstitial changes which tend to improve it.

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* Mulder, p. 105.

Wines may be made to last any length of time by increasing their alcoholic contents. But there is no advantage in this; all that is wanted is for them to last uninjured till their full flavour is elicited; after which keeping them may make them curious indeed, but will not add to their value. The less alcohol they have in them the better, consistently with their lasting long enough to become perfectly ripe.

All that can be said about the VALUE of wine known by external evidence to be pure, is a deduction from what has gone before relative to the changes by age. The value certainly is not to be reckoned by its alcoholic contents, for no amount of spirit or length of keeping will bring virtues out of wine not capable of exhibiting them. Still less is it to be estimated by mere antiquity; wine, like woman, is to be valued for its maturity, not for its age. The most notable *reductio ad absurdum* of the plan of adding an annual price to wine, is the quaint boast of the burghers of Bremen, who, by reckoning at compound interest, and including duties, expenses of cellar, &c., run up the ideal cost of their unique Rosenwein to 54,000*l.* a bottle. It never gets to any heads but those crowned with the laurel or the diadem; the birthday of a Goethe, or such an occasion as the recent Wurtemberg congress of Emperors, alone open the Rosen-keller. But let us profane outsiders flatter ourselves that we do not lose much by the exclusion. Depend upon it the wine is past its maturity, and its computed price ought to have been *decreasing*, instead of increasing at compound interest for the last hundred years.

The qualities which in a young wine indicate the likelihood of its improving by age, may be inferred from what has gone before—they are, spirit, sweetness, body, and roughness—indicating the presence of alcohol, to preserve it; of sugar, to make it taste; of albumen, extractive, and fatty acids, to act upon its alcohol and develop bouquet; and of tannin, to keep them from decaying too quick.

A rough guess may be made of a wine's latent powers by ripening it prematurely with heat. If it becomes more scented by that process, it will become more scented by age. We cannot, however, encourage our readers in these speculations, unless they have a very well-built cellar, and pay great attention to it. The safest way is to go to a trustworthy merchant, buy wine nearly ripe, and pay a fair price for it. But they will find a good deal of advantage in having some previous knowledge of the subject, in applying their theoretical acquaintance with chemistry to it, and showing their wine-merchant that they have done so.

The MEDICAL USES of wines.—This is a subject thickly clouded with all sorts of prejudices and prepossessions, as is the discussion of most substances used equally by the sick and the healthy. Persons argue that what is good for themselves must be good for their patients. We have known a plethoric dietician, who himself loved lobster-salad and champagne in the small hours, advise a starveling dyspeptic to follow his custom of taking no breakfast till noon. So a hearty rough-stomached doctor will declare one diluted alcohol just as good as another; the ascetic, or the reformed rake, will pronounce all equally bad; the gouty will dread all that is thin and acid; the aguish will have a predilection for Port.

It is very possible that prime wines may be made of all kinds, which may be equally and perfectly wholesome; but their rarity will always put them out of the reach of our patients, and what we have practically to think of in naming a wine for use, is at best a second or third-rate article. We must also choose those which are capable of being grown in quantity proportioned to their popularity, or the chances of adulteration are exaggerated. When Madeira was on everybody's table, it could not be recommended to patients, for in nine cases out of ten it was either an inferior sort or a sour imitation. But now that it has gone out of fashion, a wholesome and often a very perfect wine is to be bought of that kind, and the adulterators expend their ingenuity upon Sherry. What we want is a liquor which is either produced in very large quantities, or is not sufficiently known to the million for it to be worth imitating.

The medical questions concerning the employment of wine will be put in the clearest light for exhibiting our real knowledge and ignorance, by considering separately the physiological effects on the human frame.

The effects may be practically included under the following heads: Exhilaration, Nutrition, Arrest of Destructive Metamorphosis, Inebriation, Degeneration of Tissue, Derangement of Digestion. The three first are good—the three last bad; and the object is to secure the former, while avoiding the latter.

Exhilaration is not merely a minor degree of drunkenness. It may be produced by many things besides alcohol, and which do not inebriate—such as, for example, the essential oils, peppermint, onions, valerian, assafœtida, tea, coffee. Even eating, and the increased circulation of blood, produce the effect to some extent. Alcoholic fluids truly do exhilarate with the greatest certainty and rapidity, but not in direct proportion to the alcohol they contain. A glass of wine will raise the spirits of a healthy person as much as a glass of gin, a glass of fine claret as much as one of strong tavern port; and this is not merely from the pleasure of taste or association, for the same may be observed in fever patients, whose gustatory nerves are blunted by a thick coating of sordes.

The distinction is not only a subjective one, evident to the mind of the recipient, while it is incapable of demonstration to others. There is a real physiological difference in the effects which follow exhilarating and intoxicating doses—a difference which, in its ultimate results, amounts to a complete contrast. The former *in*crease the amount of vital powers rendered available in a given period, and the latter *de*crease them. Can there be a more perfect antithesis?

This is too important a matter to rest solely on the unassisted senses of patient or observer, and it does not do so, for the admirable experiments of Dr. Böcker have submitted it to the proof of chemical analysis. Though the whole series of his investigations into the action of alcoholic stimulants bear directly on the present subject, they are too mutually dependent on one another, and too lengthy for quotation. The general results, however, may be stated as follows:

1. The special action of alcoholic drinks is to arrest destructive assimilation—to stop the over-active processes of life in their effects upon the organism; so that, for a certain period during the stay of the alcohol in the system, less urea, less phosphates, less water are excreted by the kidneys, less carbonic acid by the lungs, and less digestion goes on in the alimentary canal, showing that the muscles, bones, nerves, &c., are not getting rid of their effete tissue, but retaining it, and making use of it as far as possible.

2. But at the same time they give rise in the body to a defensive *reaction*, which is prominent, first, immediately after taking the dose, then gives place to the special action, and on this ceasing is again manifested to a greater extent.

3. So that if a suitable quantity be taken, and if both action and reaction are allowed to exhaust themselves before the dose be repeated, more manifestation of life, represented by more excretion and more consequent renewal of the body, takes place in a given time with the alcoholic drink than without. There has been a positive gain in vitality.

4. But, if such a large quantity is taken at once that the reaction is overpowered, or if it is arrested by a continuous repetition of the dose, the manifestation of life is kept down; the body is not renewed, because its effete particles are not removed, and the amount of vitality must certainly be reckoned at a loss.*

The first-named state is Exhilaration, in which the alcohol may be fairly called a food or medicine, a medicinal food or dietetic medicine, for body and mind. The second state is Intoxication, when it is a poison to both.

Now, the exhilarating effects of diluted alcohol are very much increased by its admixture with sugar, extractive, vegetable essential oils, ethers, and the allied substances which have been described as producing the aroma and bouquet of wines. With a quantity of alcohol which taken alone would be inefficient, a delicate wine is able to produce a decided impression upon the nervous system. When, then, this is mainly sought, as in cases of mental depression, hypochondriasis without bodily ailment, nervous exhaustion, over-anxiety, hysterical fainting, vomiting, and the like, or when wine is wanted merely to smooth down the roughnesses of daily toil, we must remember that the good result may be obtained without the evil; and we can obtain it with least chance of the evil by selecting liquors richest in their peculiar scented constituents. Bordeaux, Champagne, Rhine, and Moselle wines, offer a variety of choice, the first being the most perfect and suitable to the greatest number of these cases; whilst the others have certain inconveniences, hereafter to be mentioned, which often forbid their use in the special case to be prescribed for.

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* Beiträge zur Heilkunde, von F. W. Böcker, vol. i. sect. 6. Weingeist. We have introduced the name of this author again in our heading-list, because he, and indeed all physiologists of the Schultz-Schultzenstein school, are much less known in England than they deserve. A collection of translations and abstracts would make an admirable volume for the new Sydenham Society.

The beneficial effects on the nervous system are increased by effervescence; thus, sparkling Champagne will sometimes have a most magical effect in stopping vomiting in cases accompanied with much nervous depression. And even in health, the greater exhilaration caused by genuine effervescing wines is notorious. The physiological explanation of this result is not very clear. It cannot be due to the carbonic acid alone, for the inhalation of this gas tends to completely opposite consequences. Perhaps the sudden physical change in the liquid during the extrication of the fixed air develops ethers which in a nascent state are more potent than at other times. Perhaps other gases are generated, whose properties are in themselves exhilarating. In the Champagne sent into Wurtemberg from Rheims, Baron Liebig found that for every volume of carbonic acid there were two volumes of protoxide of nitrogen* (laughing gas); and it was assumed, without absolute proof, to have been artificially introduced for the purpose of augmenting the joyous results of the bottle. The subject demands chemical investigation on purely scientific grounds; and it would, moreover, be useful to know if we could thus at will increase the required exhilaration, while decreasing the quantity of alcohol or carbonic acid.

The gladdening effects of alcohol are augmented by its mixture with other constituents of wine, but its intoxicating or poisonous effects are diminished, and thus more may be taken, with its advantages and without its evils. So that, for example, if a man drinks a pint of Mr. Brande's Marsala, he gets a somewhat larger dose of spirit than there is in half a pint of gin,† but, it is unnecessary to say, without the same bad consequences. This is partly to be attributed to the presence of the ethers‡ and sugar, but also in a great degree to the intimate combination of the alcohol with extractive and albuminous matter, so that it is not absorbed immediately by the membranes, but gradually and during a process of digestion. It is obvious that its local effect on the mucous surfaces and viscera must be thus much modified, and a powerful argument is afforded in favour of the use of wine instead of brandy for invalids.

Nutrition is an indirect effect of wine. There is shown by chemical investigation to be very little substance in it capable of building up the body. The phosphates and albumen are more readily found elsewhere, as Franklin has imprinted on our memories by his comparison of a penny roll and a gallon of beer. But alcohol seems to render the alimentary canal more ready to absorb nutriment. Farmers find this, and always try to put some waste beer or fermenting grains in their pig troughs. Physicians find it, too, and give their patients cod-liver oil in a glass of sherry when they would have it fatten quickly. The effect, however, is probably confined to oleaginous food and the adipose tissue, for the digestion of albuminous matter by the gastric juice is certainly impeded by alcohol.

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* Medical Times, Nov. 1850.

† Marsala contains 26·03 per cent. of absolute alcohol (Brande); Geneva, 49·4 per cent. (Jones).

‡ The disinebriating influence of ether is shown by its being actually a remedy for drunkenness. Twenty or thirty drops taken neat on a little oil will restore to temporary sobriety. The knowledge of this fact has been popularised in France by its forming a point in a wicked railway novel (Le Trou de l'Enfer), the author of which perhaps owed it to M. Batilliat (Traité sur les Vins de la France, p. 190).

Hence we gain the following rules concerning the administration of wine as an aid to nutrition:—1st. That the alcoholic contents are those of principal importance, and that the amount of solid or nutritive matter in the wine makes little difference. 2ndly. That we may hope help from it in increasing adipose tissue, but not muscle. 3rdly. That as its agreement with fatty food is the prime object, we must avoid those wines which are likely to make such food unassimilable, as, for example, by making it rancid; and therefore, 4thly, That sound wines with a small proportion of acid to their alcohol, and but little body to cause re-fermentation, should be selected; the types of perfection may be considered the dry Spanish wines, Amontillado and Manzanilla. And, 5thly, They should be taken along with the fatty food itself, or immediately after it.

The *arrest of destructive metamorphosis*, or what has been picturesquely called "the moulting of the tissues," is unquestionably the most important of the medical uses of alcoholic liquids. By them we are enabled to stay the progress of interstitial death in low fevers, till the period of the zymotic poison's virulence is passed, and it has either been evacuated or become inert. By them we can check the exhaustion of the body through excessive secretion, as in cases of chronic catarrh, ulcers, abscesses, amputations, &c. By them we can diminish, in ordinary dietetics, the wearing out of the body by the over-worked mind, which in this busy metropolis throws so many into the hands of the physician. But in the wielding of this two-edged sword the greatest judgment is requisite, lest we carry the effect too far. The destruction of effete tissues is part of life, and necessarily precedes constructive renewal; if, then, we check it too far, interstitial life is diminished, and the system is overloaded with matter incapable of vitality.

It is better therefore to give alcohol in a diluted form, even when we wish to produce its most decided action, as in typhus fever, for example. And it is better to give it combined, as it is in wine, with other substances of partially corresponding action, than to administer it merely diffused in water, as is sometimes done for economy's sake. Sugar, we know from Dr. Böcker's experiments, has a special effect in limiting the destruction of tissues containing phosphates, tissues of no less importance than the bones and nerves. And it is likely that similar investigations into the physiology of ethers may show some special effects belonging to them. The acids, too, and the extractive in wines, seem to prevent better than water those injurious effects upon the mucous membranes which spirituous liquors exhibit. There is, then, no extravagance in preferring wine to brandy and water in the management of low fevers in hospital and parish practice.

This is not the place to discuss details in the mode and period of administering wine in acute complaints. But one reminder may be deduced from the view taken of its physiological action—viz., to allow intervals to elapse, during which its effects may subside, and the system recover for a time its metamorphoses, so that the effete tissues may have a due exit. The night is a convenient time for this in general, but if, from any cause, that is considered inexpedient, some hours of corresponding duration should be selected, during which the administration of stimulants may be discontinued.

The wine chosen for fever cases is usually Port; but the rarity of really good Portugal wine, and the excessive badness of all low-priced imitations now in the market, render it daily more and more incumbent upon us to have substitutes at hand. The best in the London market seem to be the red Spanish wines, Beni Carlo and Cadiz; especially the former, which, indeed, is often mixed with spoiled Portuguese wine, and sold as port. It may be had in the wood at a low price, considering its strength, and is highly to be commended for hospital use in a diluted state.

Poor people, however, are not the only patients supplied with Port wine unfitted for the sick room. The prepossession in favour of antiquity causes many cellars in wealthy houses to furnish nothing but a damaged article. To find fault with a bottle that cost a great sum a great many years ago, is flat heresy; and the better way is to give it up at once, and order your patient a good full-bodied wine of a different nature, such as Madeira, Burgundy, or Hermitage.

Inebriation is a terrible word to meet with in periodical literature. It opens up a prospect of so many social and political questions, that the reader is apt to close the page in despair. He shall be let off here with a simple remark derived from wayside observation—viz., that in all countries where wine is plentiful and cheap, drunkenness is almost unknown; where it is most expensive, that vice is at its maximum.

Degeneration of tissue, as a consequence of drinking, appears to be a chronic state of that arrest of metamorphosis which has been already discussed as a remedy for disease. The effete tissue remains as an useless burden mixed up with the healthy, and is finally converted into the least vitalized of all the organic constituents of the body, oil or fat. Careful and valuable observations have been made by Dr. Böcker, on the abnormally retained blood-discs in the circulating fluids of habitual spirit-drinkers, and the appearance of the degenerated hearts, livers, and kidneys of these miserable suicides is familiar to us all.

Degeneration arises from the arrest of metamorphosis being too long and continuously kept up. Hence there is little danger of it in acute cases, where the large quantity of alcoholic remedies we find it expedient to administer is necessarily diminished as the disease recedes, and during convalescence is reduced to the ordinary allowance of health. But in chronic cases it is often a matter for serious consideration whether we shall employ an agent capable of doing along with the good we intend, an evil greater than that originally to be combated. If the dose of a stimulant be repeated before the arrest of metamorphosis has ceased and the reaction of the system has begun, a second arrest indeed takes place as before; but the postponed reaction is augmented in force each time it is delayed, and when it occurs at last, it is so painfully depressing that it becomes more and more difficult to resist the instinct to put it off, and in the end it is really dangerous to do so suddenly. This is the short history of confirmed tippling; and often we fear it may be traced in its origin to the carelessly worded advice of some medical man. Science or practice has taught him that alcoholic action will alleviate certain morbid phenomena, and he recommends it without due warning. The patient knows no harm in alcohol except drunkenness, and so long as he avoids that vice, thinks he cannot keep up too steadily the agreeable relief he experiences. Alas! much safer for him would be the occasional debauch of a man he despises as a profligate, than his own continuous steady course towards death. A drunken bout brings its own cure, and is usually allowed to be followed by reaction afterwards; but the most alarming symptom in a tippler is that he *cannot* get drunk. Day by day there is a little less and a little less life in his system, till at last his degenerated body is fit for burial.

Now, the results above described are, practically speaking, unknown as the consequence of wine; it is spirit drinking that leads to them. There are several reasons for this, independent of the chemical differences of the liquors. Wine is rarely used except at the principal meal, or as a sort of medicine in measured quantity at other hours, so that the effects have time to pass away before another dose becomes due, and no craving for increased quantity is experienced. In fact, men go on taking daily for three quarters of their life the same identical number of glasses, feeling daily the same comfort, and never finding it necessary to increase the quantity. But the spirit bottle is opened when its owner "feels to want it,"—nay, it is very often carried about the person under the appropriate name, as regards its deadly results, of a "pocket pistol."

We have been in the habit, in insurance practice, of omitting the usual inquiries about "sobriety" and "temperance," &c., which give offence and elicit no information, and substituting for them the simple question—"Do you ever take spirits *between meals?*" This is something definite, not to be shirked, and if answered in the affirmative should lead to rejection.

The subject of spirit drinking takes up more space in this article than our promise of avoiding temperance commonplaces perhaps led the reader to expect. But we have two excuses: one is, that it occupies quite distinct ground from the question of drunkenness, has much more to do with the production of disease, and is therefore much more the province of a medical reviewer. The other excuse is (we blush to write it), that no class of persons who have received a liberal education are so often addicted to it as medical men. Londoners were shocked two or three years ago at the suicide of a highly moral and intellectual surgeon, who left a paper attributing his despair to the habit of secret tippling; but they would have been less astonished had they known how many practitioners all over the country suffer from the peculiar dyspepsia of alcoholism. The long robe and her Majesty's uniforms are occasionally disgraced by inebriation, clergymen may sit too long at the bottle, but spirit tippling seems left to medical men and the classes below them. They have many temptations: hard mental and corporeal toil, sudden calls for exertion when tired, broken rest, irregular exposure to cold and wet, weary waiting in lone farmhouses for lingering labours, the dull company of ill-educated persons, the wish to be sociable and not seem proud, are a few of them. Into these temptations they do fall, and that on a large scale, especially in rural districts.

To require of an unfortunate patient and brother practitioner that he should give up at a blow that alcohol which instinct and science agree in teaching him to be necessary, is too great a demand. If he became a teetotaller, he would probably die all the sooner. Hard commonplaces about the virtue of temperance and the evil of its opposite, produce no more effect than schoolboy's themes. What he wants is—first, kind sympathy with his *misfortune*, and secondly, a rational means of getting rid of it. Now, nothing contributes more towards the latter than a clear sketch of the chemistry and physiology of the subject, and a belief that the advantages of alcohol may be had without its disadvantages. He should reflect how wine differs from the spirits which are in it, and again, how it is not so much the quantity, but the frequency of the dose, which is hurrying him to the grave and his children to poverty. The most complete relief is the substitution of wine for spirits. The very economy which was perhaps the first origin of the habit, will prevent excess in the dearer liquid. If that cannot be accomplished, let at all events drams between meals be avoided as poison; and let the addition of sugar, and flavours in the shape of lemon, fruit, or a few drops of nitric ether, make the drink approach a step nearer to the juice of the grape, and be daily more and more diluted.

Among the *Derangements of Digestion* arising from wine, it will not be necessary to dwell long upon the immediate consequences of a debauch. It is usual, in army medical returns, to report it as "febris," as indeed there is, truly enough, an ephemeral fever, but, like other fevers, it works its own cure, and civilians are not in the habit of applying to it the same euphemistic nomenclature. But, without being taken in such quantity as to be considered an excess as regards alcohol, wines will sometimes cause a disturbance of digestion, which prevents our sanctioning their use in cases where otherwise we might be willing or anxious to do so. This is always accompanied by the presence of a large quantity of acid in the alimentary canal.

In some instances this excessive production of acid follows equally all sorts of wines, and even spirits. Then it is due to the mucous membrane of the stomach being so morbidly sensitive that it becomes irritable and temporarily inflamed, so that it refuses to secrete its solvent juice, and to perform with sufficient activity the peristaltic movements. Hence the alimentary mass undergoes the acetous and lactic fermentations, instead of being digested. These patients ought to abstain from all alcoholic drinks whatsoever till cured of their morbid condition.

More commonly it follows only wines, and some sorts of wines more than others. These cases deserve much thought, because they are in danger of falling into the snares of spirit drinking, and also because very often the patient's system specially requires a stimulus which yet he cannot take without inconvenience. When we reflect on the large quantity of free acid existing in wine, we cannot be surprised at its causing some trouble in the stomach. If a man drinks half a bottle of hock, he swallows one hundred grains of acid, equal to five tablespoonfuls of lemon-juice; in a pint of claret, eighty grains; in sparkling champagne or Madeira, the same amount; in port, if he takes even this comparatively large allowance, he does not get above sixty grains; but then in the three last there is nearly an ounce of sugar, which, mixed up with the food, has a strong tendency to ferment, and turn into a fresh portion of acid at a more advanced period of digestion.

Here chemistry steps in with valuable aid. In the simple instrument of a standard solution of caustic soda, we possess a means of testing rapidly the whole acid contents of wines, and rejecting any which are thus declared unfit for our patient.

But it makes some difference what sort of acid is contained in the wine. Acetic is to many stomachs much less injurious than tartaric, and it is found that the proportion of these to one another varies very much in the products of fermentation. Thus, in Madeira, nearly one-third of the acid contained is acetic; in port, only one-fourth; in claret, one-fifth; in champagne, one-seventh; and in hock, not one-eighth, whilst the rest is the last digestible, tartaric, or its ally, racemic.*
Besides these, the tannic must be allowed for, small indeed in quantity, but powerful in operation, as its use in medicine shows.

Of course, both the quantity of acid and the proportion of the several acids vary, within certain limits, in different specimens even from the same vineyard, and still more in growths classed under a common name in the market. So that to give an opinion as to the fitness of a particular wine for drinking, we must carry our investigation rather farther than merely the application of the soda test.

The acetic acid may be estimated by distilling it off from the wine

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* See Mulder, p. 202. In 100 grammes of wine there were—

	Milligrammes of acetic acid.	Milligrammes of tartaric, racemic, &c.
Madeira	167	310
Rhine wine	66	480
Port	95	283
Bordeaux ordinaire	86	390
Champagne	64	408

slowly, at a moderate temperature, so as not to decompose the extractive, and measuring it by the standard alkaline solution.

Sugar in wine which is to be taken by itself as a medicine, is often beneficial by making the acid and alcohol less immediately irritating to the mucous membrane; but in that which is to be mixed with food it is very apt to increase the generation of acid in the stomach or cæcum to an injurious extent, generally two or three hours after meals. If an examiner of wine is disposed to reckon the absolute quantity of sugar, he will have to go to the expense of Soleil's saccharometer (which costs, with its accessories, not much under 20*l.*), and even then may have his analysis doubted by a chemist;[*] but a fair comparative valuation may be made by first neutralizing the acids with lime, and estimating the sweetness which remains by the taste. This is done by measuring the quantity of water which requires to be added before all trace of it ceases to be perceptible to the palate.

The injurious effect of ill-prepared effervescing wines is easily explained by the large quantity of undecomposed ferment they contain. This is set in action by the warmth of the alimentary canal, and can hardly be overcome even by the strongest digestive powers. Flatus and acidity are its normal consequences.

The proverbial unwholesomeness of "mixing wines" is not explained by chemistry. In most cases the evil may be traced to the temptation to increased quantity, or to the taking of some sorts which even, if adhered to throughout the meal, would be equally hurtful. In fact, the precept of keeping to one wine seems to rest on the same principle as keeping to one meat.

Hitherto the genuine and perfect juice of the grape has been spoken of; but it is certain that much of the difficulty which patients experience in digesting wine arises from their use of an impure article. There may be found often a much larger quantity of acid than the taste indicates, concealed by molasses, or perhaps by sugar of lead. Instead of tartaric, there may be malic acid, the consequences of which to the digestion are well known to the eaters of rhubarb tarts and the drinkers of hard cider. There may be alum, copper, iron, nickel, nay, even arsenic (Batilliat, p. 142), accidentally added to inferior wine, and nobody knows what else, for purposes of fraud.

This brings us to the subject of the ADULTERATIONS. It is right to have a clear understanding what is meant by this alarming word. Now, M. Batilliat[†] is, according to his title-page, a druggist as well as a wine-grower at Macon, and is by no means an industrial purist, so that we may take his definitions as not too straitlaced even for the present state of the market. He considers as falsified:

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[*] The fallacy in Soleil's polarizing saccharometer as a quantitative test is, that uncrystallizable sugar rotates the ray to the left, whilst glucose and cane-sugar rotate it to the right. So that a sample of sherry, for example, with its usual allowance of the uncrystallizable, might be so adulterated with white lump, molasses, caramel, or malt, as exactly to balance and appear to contain no sugar at all.

[†] This poor gentleman is badly used by transcribers. Prof Mulder calls him Batill*at*, and having thus lost an *t* in the hands of the Dutch, he has his *t* turned into a *c* by Dr. Bence Jones, reappearing as Batill*ac*. But his fate is nothing to that of Mr. Hitchcock, whom Dr. Jones calls "Hitschok;" and then, when the indignant reader tries to set matters right by verifying the quotation, he is told to look in a periodical of the yet distant date of 1884! He has as a companion in misfortune our well-known friend Dr. Lewis Beck, who is throughout the volume designated as "Beek." What will brother Jonathan say to this denationalizing of his shining lights

"1st. Every drink sold as wine, and not made from fermented grape must.

"2nd. Every mixture of wine with another liquid of less value.

"3rd. Wines whose unwholesomeness and other bad qualities are concealed by the addition of foreign matter.

"4th. Those artificially coloured.

"5th. Those whose volume is increased by substances not found in the wines of the climate which they are sold as coming from."*

M. Batilliat refuses to consider as adulteration those operations which are technically termed "blending"—that is, the mixture of natural wines of different vintages: such, for instance, as adding a very spirituous or full-bodied wine to one poor or thin; a brilliant to an ill-coloured wine, a sweet to a dry, or even a white to a red wine. He says that if these compounds were looked upon as impure, we should have to apply that term to all wines that come into the market. This is probably true as regards France, where the operation has been so long and so scientifically practised, that really a better article is turned out than if each vineyard or harvest furnished an exclusive liquor. There are many wines, though not in themselves agreeable, which mix very well, and often enable a more delicate growth to stand the sea-voyage and to ripen better in cellar. If it is thoroughly fretted in, the same remark will apply to the judicious mixture of alcohol. The most conscientious wine-merchants in the City refuse now-a-days to assign different names to their samples of French wines; they do not offer you "Lafitte," or "Léoville," or "St. Emilion;" but "first," or "second," or "third growth claret;" or "Burgundy" of several prices, and not "Chambertin" or "St. Georges." As an universal rule, if your wine-merchant is pedantic about the names of his French wines, he is either deceiving you or he is very ignorant of the Bordeaux and Dijon markets. All that he can really know is that it comes from one or the other districts, and contains no other grape. The same observation will apply equally to Portuguese, Spanish, and Madeira wines; but perhaps those of the Rhine and Moselle may claim more accurate pedigrees—at least when they are of noble birth. One does not know whether to regret or to rejoice over this purity. It is true that by it the tables of a fortunate few are adorned with an occasional bottle of exquisite Steinberg or Johannisberg; but then, if that perfect liquid had been added to the inferior common stock, it would have made the stuff pressed upon us at ordinary dinners a less hazardous speculation to the stomach. We cannot but agree with M. Batilliat in his toleration of blending wines of the same district.

Another case of warrantable addition is the scenting of wine with orris-root, elder-flower, raspberries, &c. It is expected by customers, and is innocent so long as it is not done to conceal a bad odour.

We may also tolerate the additions of alcohol carefully fretted into a wine which may thus be enabled to be preserved longer; or of water to one which is stronger than customers require. It will always be impossible to detect these by chemistry or by the taste, and both the intention and result are good. The case, however, is different where both water *and* alcohol are added, the design of which must be fraudulent, and which will be mentioned in a future paragraph.

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* In trying to improve upon this division of the subject, Professor Mulder has furnished one which has the double fault of being longer and less exhaustive. It is rash to attempt rivalry with a Frenchman's innate talent for classification.

Of adulterations which may be rationally considered as real frauds, many more kinds are probably practised than are ever likely to be known, except to the inventors. M. Batilliat seems to shrink from directly revealing trade secrets as instances of his classes, so we will take from other sources a few which seem specially to apply to the London market.

Perhaps the above-named worthy grape-grower is not aware how in England we make the wine of his own district (Macon). Here is the receipt from the 'Wine and Spirit Merchants' Own Book' (p. 14):

> "*Macon* (*Burgundy*).
>
> "Take 8½ lbs. of very dry raisins; pick the berries off the stalks; put them in a small cask where red wine has recently been kept; take off the bung, and pour in 5½ gallons of river-water; add a little less than two quarts of elder-raisin juice, and a quart of alcohol (4° o. p.); let it work four days, stirring it every six or twelve hours; bung it close, and after six weeks' time, clarify it with the whites of two eggs, and bottle it."

This is a pretty fair example of the first class of sophistication, for though there is no must fermented in the preparation, there are at any rate what were once grapes. But let us not flatter ourselves that we are secure of having even raisins, for it appears at page 33 that there is such a thing as "*White wine from pears, perfectly equal to the best white wine from grapes.*" In this there is not a trace of the fruit of the vine, yet we are told it "may be worked into excellent champagne by undergoing the preparation given at p. 17." Next page we learn that *beetroot-juice* is "a truly precious substitute for the grape must in the manufacturing of all artificial wines, as by mixing it with various aromas it can be made to imitate all wines." As apples, pears, rhubarb-stalks, &c., contain malic, and grapes tartaric acid, it is then recommended to add "a sufficient quantity" of bitartrate of potash or tartaric acid, and to scent the mixture with vine flowers. The colour is given by "mulberries, red beet-root, and wild blackberries." The enormous quantity of acid thus introduced must of course be concealed by molasses or potato-sugar, and the well-known effects of tavern wines are thus easily explained.

It is not to be supposed that the only danger lies in the above-named mixtures being sold in their native foulness. They are more commonly mixed with real wine, and thus the adulteration comes under the second head in M. Batilliat's list. Fortunately, science can do something towards exposing the imposture; the detection of malic acid to any extent beyond a mere trace,* shows that other fruits besides grapes

* Malic acid may be distinguished by its calcareous salt, which is soluble, whereas the tartrate and racemate are precipitated when milk of lime is added to wine.

have been used, and stamps the liquid as adulterated. Again, the odour and flavour of beet-root are so peculiar and so incapable of concealment, that a very little practice makes its discovery easy.

Another form of adulteration which will come under M. Batilliat's second category, is the addition of alcohol *and* water. Each separately has been conceded to be possibly an improvement, and when an improvement, not capable of discovery. But both together, they *must* be used with fraudulent design, for the same wine cannot require such opposite constituents; so that detection is a matter of practical interest. Professor Mulder seems to despair of it, sagely remarking that "alcohol is alcohol," and inferring that the estimation of its quantity does not tell you whether it comes from the genuine wine-vat or the surreptitious still. True, "alcohol is alcohol," but it is not coarse brandy or potato spirit. These are what the avaricious adulterator is apt to add, and the same desire for gain which suggested the fraud, prompting him also to sell as soon as possible, there is no time for the spirit to be incorporated with the extractive, and the nauseous focale oils left in it may often be tasted or smelt in the bottle. Should they not appear so easily, we may apply a principle before alluded to—namely, that these substances are peculiarly powerful in a state of minute division. Dilute the suspected liquor largely with water, and then if spirit has been recently added, you are pretty sure to taste it. Another method is given by M. Basset:—"Warm a glass in your hand, pour into it some of the suspected wine, and then if it does not owe its spirit to natural fermentation, oily drops of alcohol rise up against the sides."* Both these plans may be observed to be grounded on the slowness with which spirit unites itself to the other constituents of wine, if not generated along with them. We prefer the first.

The adulterations included in the third class must be distinguished carefully from honest methods of saving wines in peril of decay. These have been before alluded to, and compared with the medical treatment of disease; either some deficient normal constituent is supplied, or else something is temporarily added which removes the peccant matter, and is then itself removed, leaving the wine pure but weak. Of a similar innocent nature is the diminution in young wine of some constituent which is in dangerous excess—such, for example, as the abstraction of free tartaric acid by lime or by the neutral tartrate, which precipitate it in an insoluble form easy of removal. Of course it would be impossible to ascertain whether these "doctorings" had been practised, even if the knowledge were of any value.

Of a very opposite moral character are many of the recipes in the 'Wine and Spirit Merchants' Own Book.' Here we find chalk, marble, &c., used to counteract, not the tartaric acid of youth, but the "sourness" or acetic acid of premature decay. A very different thing; for the tartrate of the earth being insoluble, is left in the cask, while the acetate goes down into the stomach. Hence Falstaff was able to detect the "lime in the sack," which he so justly denounces as rascally. Equally bad is the addition of molasses or potato-sugar to cover the acid; indeed, the consequences to the digestion are usually worse, because the acid is left in its native strength. But of what punishment is he worthy who could devise the following infernal recipe?—"To keep wine from turning sour: put in the cask two pounds three ounces of small shot"!!! Ah, Professor Mulder, when your innocence said that lead was no longer used for the adulteration of wine,* you did not know the wickedness of an Anglo-Saxon in 1855. But you are not shocked half enough yet. What do you think of this? "In extreme cases, when all the previous receipts have been tried without any satisfactory result"—that is to say, when the wine already contains lead, alum, brandy, chalk, charcoal, chloride of lime, barley, honey, &c. &c.—"take a small pinch of OXALIC acid, and put it in the bottle"!!! Nay, reader, do not be sceptical, there are the words in page 32, in all their normal horror.

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* Traité de la Fermentation, p. 540. Paris, 1858.

It is unnecessary to say that the detection of these gross adulterations is as easy as possible, and that any future "Analytical Commission" of food and drink will have no difficulty in telling us the exact number of disciples who follow the precepts of Mr. Dornat.

The artificial colouring of wine might have been included in the last category, as it almost always has for its object the concealment of decomposition, or at best the concealment of the consequences of a bad harvest. It is certainly a fraud, because the intention is to get a higher price than the article is worth. The simplest method of detecting it is that used by M. Batilliat for red wine. He treats it with ammonia, which produces in all wine, genuine or not, a brown tint. If, then, tartaric acid be added, the true colouring-matter of the grape is not affected, but remains brown, while all dye-stuffs are restored to their original hue.

Another method is to saturate the wine with tannin, and then precipitate the addition with gelatine. Genuine wine loses all colour after a few repetitions of this process, whilst that which is artificial remains permanent. There is something much more definite and practical in these plans than in the attempt to decide on the individual matter used for adulteration by means of the hues it exhibits under different reagents, for it is obvious that a shrewd adulterator would only have to mix his colours completely to puzzle a chemist. Potassa, for example, gives a violet precipitate with mulberries, a red with beetroot, and a blue-violet with privet; but who can describe or anticipate the tints arising from various mixtures of two or more of these substances?

The main use of discovering that artificial colouring-matters have been used, is to lead to the detection of some other sophistications, for in themselves they are not of much consequence. Neither, indeed, is it at all likely that they are often employed alone, for, as M. Batilliat remarks, it is not worth the adulterator's while. Strong, high-coloured wines of the South furnish at the same time abundant colouring-matter and an additional quantity of spirit, and if bought young, are so cheap as to gratify the most avaricious. So long as a wine-merchant can get Beni-Carlo and lower-class Rhone wines at their present price, he need not run the risk of detection by using logwood or elderberries.

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* Mulder, p. 305.

M. Batilliat's fifth category is intended to designate the adulterations alluded to in the last sentence—the most difficult, if not impossible, to detect of all, and the most extensively practised. The mixture with inferior wines of those from another district, so as to produce a temporary resemblance to a superior growth, is injurious, because in many cases the factitious liquid much sooner decays and disappoints the purchaser than the vintage which he supposed himself to be buying. Beyond this, it is difficult to say what harm is done, and in cases where the wine is really made more permanent, perhaps the accusation of fraud should not be brought. However that may be, it is very profitable, and is not only practised under the rose in all centres of the wine trade, but almost entirely supports, on the shores of the Bay of Lyons, one of the most thriving populations in France. The port of Cette is crowded with the fleets of all civilized nations loading with wine, made indeed from grape-juice, but which in no one instance is pure from the vineyard whose name it bears.* Order whatever vintage you like, of whatever peculiar or delicate flavour, and the Cette manufacturer, worthy descendant of the *Græculus esuriens* whose land he inhabits, will provide you with it on the shortest notice. But do not delay long to drink or sell it, for if you do, all resemblance to the genuine article is gone.

M. Chaptal lets out some trade secrets in a description he gives of the preparation of cheap Bordeaux for our market. He says that the fermentation of inferior wine is arrested by the operation of sulphuring, and that it is then sold under the name of "*vin muet.*" "This is mixed with Beni-carlo, Hermitage, and Bordeaux, and the mixture is fermented to form the wine which is drunk in England under the name of claret."

There is every reason to believe that of late years the imitation of special vinous flavours has been much assisted by the discovery of so many ethereal substances which resemble them. Acetic ether is not used in medicine or in the arts, yet it is made in considerable quantities by chemists. On our inquiring at a large wholesale house whether they ever sold œnanthic ether, the reply was, "Oh, yes, we sent two ounces to Norwich this morning."

Nitrous ether is considered by M. Batilliat so useful to his trade, that he has figured and described in his volume an apparatus for its fabrication. And it is not likely that the fruity flavours found in other similar substances will be neglected.

In all the forms of adulteration last mentioned, chemistry must be quite at fault. Indeed, M. Batilliat contends that the addition of ethers is not an adulteration at all, that it is not unwholesome, and that if people do not like bouquet, they need not buy it. A doubt, however, may be suggested as to the keeping of these "improved" wines, and therefore as to their being quite suited to the purposes of those who purchase them. And in default of chemical tests, we would recal the mode before mentioned, of trying by artificial ripening whether the liquor is likely or not to gain in flavour by age.

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* Strange to say, the rarest flag of all is the Union Jack. (See 'Claret and Olives,' an amusing scamper through South France.) The fact is, that if we must have mixed wine, we like to mix it ourselves and get the profit.

This article must not extend to a greater length, in justice to subjects of more directly vital interest, but probably enough has been said to show that a scientific interest attaches to wine, and to justify a hope that the public may see the advances of chemistry in this direction embodied in a good readable book in our language. What we should prefer would be a new edition of Dr. Henderson's work, retaining the ornamental character of the original, as suited to a joyous subject, but adding such chapters as are requisite to keep up with the physiological, medical, and moral questions with which our generation has surrounded wine.

REVIEW III.

The Phenomena of Spinal Irritation and Other Functional Diseases of the Nervous System, Explained, and a Rational Plan of Treatment Deduced. By THOMAS INMAN, M.D. Lond., Lecturer on the Principles and Practice of Medicine at the Liverpool Royal Infirmary, Physician to the Northern Hospital, President of the Liverpool Literary and Philosophical Society.—*London:* 1858. 8vo, pp. 201.

HYSTERIA! spinal irritation!—what a mass of medical ignorance and quackery have these two words to answer for! They have verily been the scapegoats of medical science, and have done more to mislead the student and to serve as a cloak to careless practice and routine, than even "water on the brain" or "disease of the liver." Names without a definite or definable pathological meaning, they have but too often prevented an inquiry into the real causes of a patient's complaint. We fear that no amount of medical literature and scientific inquiry, however successful in itself, will ever prevent hasty generalization or routine treatment, where medicine is regarded as a trade rather than a science; still we must acknowledge the high merit of those who seek to place any given question on a sure basis, and, like the author of the book before us, withdraw one or more of the excuses which indolent men have to cover their own shortcomings. Dr. Inman, whose views we cursorily and commendingly alluded to a year ago, in speaking of a pamphlet in which he discussed the nature of certain painful affections, now brings the subject more fully under our notice, and argues with such force and clearness, that we should be surprised if he does not gain many adherents, and do more to undermine the stronghold of hysteria and spinal irritation than any previous writer.

Spinal irritation is merely the call, in the title of Dr. Inman's work, to excite the attention of the passer by; the whole tenor of the book is to show that such a thing has no existence, and that what has received the name is a complex of symptoms induced in various ways, but all dependent upon general debility of a constitution in which individual parts have been taxed beyond their strength.

The first part of Dr. Inman's very interesting book is in the main a reprint of the pamphlet above alluded to, and comprises eight chapters, in which he successively examines the different phases of muscular pain in different parts of the body, which have hitherto generally received an explanation at variance with that interpretation lucidly given by the author. On a former occasion we were unable to devote as much space to Dr. Inman's views as we think they merit. Without going somewhat into the details of his doctrine of muscular pain, we should be unable to render intelligible his teaching on the subject of spinal irritation. We shall therefore offer no further apology for laying a brief analysis of the former before our readers in the first instance.

The following extract exhibits the anatomical and physiological basis upon which Dr. Inman's views rest:

> "On the whole, the tendinous parts are more frequently the seat of pain than the fleshy, but when the affection is of a spasmodic nature, the fleshy parts alone are implicated. The reason for this is to be sought by inquiry into the minute anatomy of muscle. We know that every muscular fibre terminates at each end in being attached to a tendinous fibre; that these again are, singly or collectively, inserted directly into the bones. Whenever a muscle contracts, there is a strain upon all parts of it, and a direct effort to tear it from the bone or to separate itself into its integral parts. There are therefore *two* strains upon the tendinous fibre at *each* end of the muscle—one where it joins the muscular fibre, the other where it is inserted into the bone. In addition, however, to this consideration, it must be borne in mind that (speaking generally) the muscular fibre is much longer than the tendinous one, and the strain which is divided over a long space in the former, is concentrated in a small space in the latter. In corroboration of this view, we may add that, where the muscle has a long tendon attached to it, as the gastrocnemius, for example, the pain arising from over-stretching or over-exertion is confined almost exclusively to the origin and insertion of the tendon, the intermediate parts being free from pain." (pp. 3 *et seq.*)

It is easy to satisfy oneself of the fact by trying to touch the ground with the tips of the fingers while the feet are close together and the knees are straight. Severe pain in the popliteal region is the result when the experiment is first performed. The application of the fact to pathology when once suggested is easy enough; wherever unusual or excessive muscular exertion has been employed, aching pains show that a muscle or a set of muscles are taking their revenge; in persons constitutionally weak or debilitated by disease, these pains necessarily set in much more readily if undue exertion be used; what to the healthy person would be a painless and pleasurable effort, becomes under such circumstances fraught with anxiety and pain; and the danger then is that the phantom "Inflammation" steps in, and lures the medical man on to the employment of mercury and black-draught, leeches and blisters—agents calculated indeed to insure a return of spasm and ache, but little likely to remove them. The debility that causes the strain of the muscle upon its tendon to become a source of pain, is also a frequent cause of spasmodic action in the muscular tissue itself; here the locality affected is necessarily different, lying midway between the muscular insertions or in the parts most supplied with muscular fibre. By a combination of the aching pains and the spasm, the most formidable organic diseases may be simulated, and antiphlogistic and other reducing modes of treatment appear imperative, whereas a careful inquiry would show the diametrically opposite procedure to be essential to the patient's recovery.

We give the heads of the following case, because it will illustrate these points:

> "Mrs. T., aged about fifty-four, came under Dr. Inman's care, suffering from bronchitis and asthma. She had been under medical treatment thirteen years, and informed me that she had, in addition to her other ailments, enlargement of the liver, and a tumour in the uterus. Her severest sufferings, however, arose from intense pain between the shoulders and in the occipital region of the head; it was, she said, as if something were burning her with a hot iron. She had, too, pains in the loins and small of the back, and, she added, suiting the action to the word, there was continued grasping pain all over the abdomen, as if something were always drawing her up; and so severe was this when she walked, that she was often obliged to lay hold of the palisades in the street to draw herself up by, and relieve the pain. Bed alone gave her a degree of ease, but her troubles pursued her there, for at every turn the abdominal walls were drawn up into lumps on one side or the other. Life was burdensome, and she longed for release." (pp. 16 *et seq.*)

The whole antiphlogistic artillery had been successively employed to combat the various symptoms, with no other effect than that of aggravating them; after careful inquiry, however, into her case, Dr. Inman elicited the following particulars:

> "Originally a healthy woman from the country, she had married a gentleman who had a profound contempt for any lady who indulged in luxurious habits. She had ever acted as affection dictated, and sat erect, without using any artificial support. As long as she was strong, the exertion brought no suffering, but when menorrhagia, diarrhœa, and the like had pulled her down, the muscles refused to do their work without pain. The bronchitis kept up debility; wine and other stimuli were not adequate to give the necessary strength, and she neither had the inclination, nor had she ever been directed, to give her muscles less work to do. . . . There were the usual physical signs of bronchitis over the lower halves of both lungs, but percussion showed that the liver was natural in size, and it seemed possible that the supposed enlargement had been nothing more than a cramped state of the external oblique on the right side."

Dr. Inman assured the lady that all the pains were muscular; and by frequent rest on a sofa and an easy chair, by avoiding tea, the exhibition of mild expectorants, steel, and cod-oil, she gained strength so rapidly, that at the end of a month she was again able to enter upon the ordinary enjoyments of life.

> "The pains, and aches, and spasms had all gone; the cough was all but well, and she who had previously risen at eleven and retired at eight, now rose at eight and retired at eleven."

The diagnosis of the muscular and fibrous pains is determined by being of a hot and burning character, by being absent in the morning and increasing towards bedtime; or if the result of excessive exertion on a preceding day, by occurring early in the morning and passing off as the day advances; by being commonly relieved by steady pressure, though when of long duration, the parts may become tender to the touch; by being induced by excessive exertion in a strong person, or by a weak muscle having to do the work of a strong one; by relaxation or artificial support affording relief; by the pulse remaining unaffected; by the patient, when describing the seat of pain, almost invariably, though of course unconsciously, moving the hand in the course of the fibres of the affected muscles; and lastly, by the pain of cramp often coming on suddenly during the night, while the patient is moving.

If our readers will pass their individual experience in review, and compare their reminiscences with the previous statements, they will probably be able readily to suggest the points at which the muscular pains spoken of most readily occur. A glance at the illustrations prefixed to the letter-press of Dr. Inman's book, which we would willingly reproduce, would render the matter still more intelligible. Still, the enumeration of the points at which the pains are most commonly felt, will at once suggest the anatomical relations to which they are due, upon Dr. Inman's theory. The interscapular aponeurosis, the occipital and the claviculo-scapular insertions of the trapezius, are perhaps among the most common seats of the pain.

> "How many must have noticed the frequent occurrence of pain in the shoulder of phthisical subjects—so common, indeed, as to be considered by many as a characteristic sign of local pleurisy—and yet how strong must have been the feeling of surprise in many to find the patient refers the pain to a part distant from the apex of the lung."

Or, to take a corresponding point anteriorly, how often do we meet with severe pain at the insertion of the lesser pectoral in phthisical subjects, which, like the former, is erroneously attributed to inflammation, and yields only when treated by narcotic and tonic applications? The erector spinæ, including the sacro-lumbalis and longissimus dorsi, from the labour thrown upon them in supporting the trunk in the erect position, suffer very frequently, as our female patients amply verify, both in their complaints, as in the gratitude they constantly evince for the recommendation of warm plasters applied over the seat of pain—plasters that can scarcely be supposed to act in any other way than by the "support" to which the patients themselves so constantly attribute the relief afforded. How often are we called upon to prescribe for pain in the left hypochondria of anæmic females? a pain that we think may be more readily explained upon Dr. Inman's theory, by attributing it to the tension of the tendinous insertions of the serratus posticus inferior, the sacro-lumbalis or quadratus lumborum, than by referring it to intercostal or splenic neuralgia. How often, too, is disease of the liver or of the kidneys made the wretched excuse for blue-pill and alkalies, where steaks and steel would insure a rapid anæsthesia. In fact, the suggestion of muscular and tendinous pains is so palpably just in a large number of our patients, especially of the female sex, and the prevailing tendency to look upon all disease as indicating a tonic and stimulating plan of treatment is so strong, that we almost fear that the promulgation of Dr. Inman's views may, by giving an additional impetus in the same direction, cause a dangerous neglect of all reducing agents in disease, just as hitherto the bulk of practitioners have depended more upon "antiphlogistic remedies" than was warranted by science or justified by the results.

Instances will readily suggest themselves of the glutæi, the intercostals, the diaphragm, the abdominal muscles, the large pectoral and other muscles, being affected. We cannot refrain from extracting the following case, as showing how important a correct diagnosis is. The delinquent in question will be found to be the rectus abdominis:

> "John Williams, aged forty-four, labourer in white-lead works, and of tall, spare build and sallow complexion, was admitted into the Northern Hospital, complaining of severe pain at the epigastrium, supposed to be the result of the baneful influence of lead. The pain was described as a dreadful weakness, and was referred entirely to the ensiform cartilage. He had been repeatedly under treatment for it, had been blistered and leeched without relief. At his admission he was wearing a large strengthening plaster. A close examination of the heart, lungs, and abdomen, failed in detecting any disease. There was no blue line round the gums; the tongue was clean, digestion indifferent, the bowels regular; both legs were very remarkable from the number and size of varicosities in the veins. Failing to ascertain any serious complaint, I asked him how he was on Monday morning (i.e., after rest on Sunday). 'Quite well, sir,' was the answer. 'And on Saturday night?' 'Quite done, sir: so bad I can scarcely reach my home; it often takes me half an hour [to go half a mile], and I am sometimes fairly doubled up with pain.' I next inquired what his work consisted in, and found that it was to raise from the ground, and throw up to a stage above him, heavy materials, which involved frequent contraction and a frequent stretching of the recti muscles of the abdomen. I ascertained that towards the end of the week the different segments of the rectus were frequently cramped; that he had about the same period lumps*—i.e., isolated cramps in the left external oblique; and that he had occasionally pains in the region of the erector spinæ. I considered the case one of simple over-exertion, directed the man to remain in bed, gave him steel and cod-liver oil, and on my next visit, two days after, the man declared himself quite well. He remained in the house, however, until he was sufficiently improved in health to bear the hard work he had to get through without painful results."

How often may the hypogastric pains of females be due to stretching of the pubic insertion of the rectus, or of the tendinous aponeurosis of the external oblique, which have been treated as inflammation of the womb, the ovaries, or the bladder? How frequently are obstinate pains, which the medical man has in vain attacked by the whole *apparatus medicaminum*, speedily removed by change of air, scene, and diet, calculated both to rest the part affected and give tone to the system, while an earlier recognition of the muscular and tendinous origin might have rendered unnecessary the interruption of the ordinary mode of life, and saved the patient much bodily and mental suffering?

The first five chapters of the book have hitherto occupied us.

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* Query, 'phantom tumours'?—Ed.

Cramp, in relation to the questions under consideration, is the subject of the ensuing three chapters. Numerous illustrative cases are adduced to explain and corroborate the author's meaning, and we have read these, like the preceding chapters, with much interest and benefit. We think, however, that what has already been said will suffice to indicate the character and scope of the work, and we wish to reserve the little space at our disposal for a brief analysis of the second division of the whole work, which commences with the eighth chapter.

Although the reader may surmise the application of the muscular theory of pains to "spinal irritation," this complex of symptoms is not adverted to till now. The remaining eight chapters are devoted to its consideration. After discussing the views of some of the more prominent authors who have written on spinal irritation, Dr. Inman proceeds to show the weak points of the whole doctrine, and demonstrates—we think satisfactorily—how the spinal tenderness, which is the fundamental feature of the malady, is brought about by strain upon the spinous processes caused by the tendinous expansions attached to them. The application of the theory to other symptoms, and the corroborative arguments deduced from the results of treatment, must be sought in the book itself; but we may be allowed to insert here the following summary of the author's views on the subject:

> "We believe that, the vast majority of the symptoms considered, the results of spinal irritation arise from over exertion of one or more portions of the muscular system in debilitated subjects.
>
> "That the spinal tenderness has a similar origin.
>
> "That the other symptoms, commonly considered as *resulting from* spinal tenderness, are *concomitants* only, and referrible to a common cause."

After these remarks we find the author inquiring into the relation existing between hysteria and spinal irritation. We shall be prepared to find him accounting for many of the anomalous symptoms of hysteria upon the same basis upon which we have seen that he places those of spinal irritation. Hysteria again leads Dr. Inman to the consideration of other disturbances of the system, which are the result of excessive nervous action, and the exhaustion consequent upon it. Insanity, spectral or aural illusions, tic, chorea, convulsions, catalepsy, coma, urination, vomiting, diarrhœa, or jaundice, are successively viewed and inquired into in this light. But although the remainder of the book contains much that is interesting and suggestive, we cannot dwell upon the author's arguments and illustrations.

We cannot, however, part from him without cordially acknowledging the high merit of the work before us; the lucid and scientific manner in which the various topics are handled; nor without especially adverting to the evidence that pervades the whole that it is written by a sound practitioner and a thoroughly enlightened physician. Dr. Inman's book cannot fail to contribute materially to abolishing the term "spinal irritation," by substituting a physiological reality for a dreamy phantom; it aids in like manner in circumscribing and limiting the application of "hysteria" to definite manifestations of morbid nervous action.

Review IV.

1. *Den Spedalske Sygdom: dens Aarsager, og dens Forebyggelsesmidler.* Et Folkeskrift af D. C. Danielssen.

The Spedalsk Disease: its Causes, and the Means of Prevention. A Popular Treatise, by D. C. Danielssen, M.D.—*Bergen*, 1854. pp. 34.

2. *Norsk Magazin for Laegevidenskaben.* X. Bind.

Norwegian Magazine of Medical Science. Vol. X. Parts ix. and x. 1856.

We have more than once in the pages of this Journal called the attention of our readers to the symptoms of the malady which, under the name of leprosy, once pervaded the whole of Europe, but at the present day is confined to a few distant and limited districts in the north, and to some of the Mediterranean shores. Our notices above referred to have been almost entirely confined to the symptomatology and pathology of the disease; on the present occasion we seek, through the documents now before us, to determine its causes, and the circumstances that favour or are opposed to its development.

In the fifteenth century leprosy prevailed over all Europe, but from that period it gradually declined, receding before the advancing civilization and the improvements in the condition of the poor, until, in most places, it entirely disappeared. In England it has probably been unknown for the last two hundred, or even three hundred years; in Scotland, where much less change took place in the habits of the people, it lingered to a period within the memory of persons yet living. Professor Simpson has shown that it was not extinct in Shetland till the close of the last century, for in 1798 a well-marked case of tubercular leprosy from Shetland was observed by Dr. John Thompson in the Edinburgh Infirmary. In Germany, and in the greater part of France and Italy, the leprosy seems to have ceased, or nearly ceased, its ravages about the same time as in England, for the funds of the leper-houses were withdrawn by the different Governments in the middle of the sixteenth century. In Germany it may now be said to be extinct; in France a few isolated cases are yet to be found, chiefly in the neighbourhood of Marseilles, in Rousillon, and in Languedoc; and, across the Spanish frontier, in Catalonia. In the kingdom of Sardinia, about sixty cases are reported as existing by Dr. Granetti; and many of these are to be seen at Varazze, a small village in the neighbourhood of Genoa. In Asia Minor, Arabia, and throughout the East, leprosy prevails still to a considerable extent; at the Cape of Good Hope it is a common and formidable disease; while it is supposed to have been transplanted to Surinam in South America by African slaves. In the island of Madeira, to which so many resort for health from this country, there is a leper's hospital of considerable size, and still occupied by patients.

Turning to the north of Europe, we find that in the Faroe Islands leprosy was so frequent in the sixteenth century, that, at a time when it was declining over almost all the rest of Europe, it was found necessary to erect a leper's hospital in the town of Thorshavn. By the end of the eighteenth century the malady had almost entirely disappeared in Faroe, and at the present day it is unknown in that group of islands. In Iceland, leprosy still lingers in a few spots, especially on those coasts where the inhabitants are chiefly engaged in fishing. In 1768, the number of lepers in Iceland was computed at 280, although a great proportion of the leprous families had been swept off by the great small-pox epidemic of 1707. In 1838, Dr. Hjaltelin found only 128; and in 1846, when the last census of the lepers was made, not more than 66 could be found. The cause of this sudden diminution of almost one-half in ten years, may possibly have been the great epidemic of measles, which in the previous year had carried off so many of the afflicted lepers. In Sweden, Dr. Huss informs us that the malady is almost extinct, even in the northern provinces bordering on the Gulf of Bothnia; but it is only within the last forty years that it has disappeared from Bohuslän, and other provinces in the south of Sweden.

In Norway, along the western coast from Stavanger to Tromsoe, leprosy has prevailed from time immemorial, extending up the deep fiords which there cut into the land, prevailing on the islands which are so numerously spread along the shore, but rarely showing itself in districts far removed from the sea. Perhaps it is in the neighbourhood of Bergen, and from thence northwards to Romsdal, that the principal locality of the disease is to be found; and it is probable, too, that the vicinity of Bergen has long enjoyed this bad pre-eminence, for we find a leper's hospital established there as early as the year 1277. This was the Hospital of St. Katherine, but it is supposed that in 1311 the lepers were transferred to the hospital attached to the church of St. George, and under this appellation the leper house has continued to exist to the present day. The present building does not date further back than the year 1702, when it was reconstructed after a devastating fire; but, to judge from the arrangements, the ancient form was still rigidly adhered to. We can scarcely imagine a greater contrast than that presented by this ancient leper-house when comparing it with the elegant and commodious hospitals of modern days. The whole building is of wood, the chief apartment being a large hall or common room, round which runs a gallery at some height from the floor. The roof is black with age, and the whole room is dimly lighted by a large window at one end. Around the hall are numerous little cabins, resembling the state cabins of a ship, and of sufficient size to contain two beds, which, however, occupy at least two-thirds of the whole space. Opposite to the door, which communicates with the hall, is a small window, like the port-hole of a ship, admitting a little light, and, when opened, also a certain quantity of air. In respect to diet, everything is on an equally primitive footing. Each inmate provides his own food, and prepares it likewise. Around the huge furnace-like chimney, numbers of lepers, in all stages of deformity, may be seen cooking their rude meals of such provisions as the scanty allowance from their parish enables them to obtain. Many of these lepers have been inmates of the hospital for years; many are blind; some are crippled by the loss of their fingers or toes; and all present the distortion of the features, either by paralysis or from tubercular deposit, which characterises this disease. St. Jörgen's Hospital is probably unchanged in all its arrangements for the last three hundred years: it is, in fact, an asylum for lepers, and not a hospital for the cure of disease. To the medical archæologist it is replete with interest. He has here before him the old leper-house and the old leprosy of the middle ages, and he can study the disorder among a people primitive in their habits, and, in common with the hospital and its arrangements, scarcely influenced at all by the progress of the age.

Had the course of the leprosy in Norway been similar to that in the rest of Europe—had it declined as almost everywhere else during the last two hundred years—St. Jörgen's Hospital would have been sufficient for the wants of the population, and would probably ere this have been closed altogether. In Norway, however, we are met by the startling fact—admitted on all sides to be correct—that within the last thirty years, so far from receding, this terrible disease has made appalling progress, and that this has occurred not only in the districts formerly subject to the scourge, but the disease has likewise shown itself in parts of the country where it was previously unknown. Were the statistics of Norway as imperfect as they are in other countries, a reasonable doubt might be entertained of the accuracy of the report; but, as is well known, the Scandinavian kingdoms have in this respect set a laudable example to the rest of Europe, and the tables of mortality, &c., which they can present, are probably the most accurate in the world. The first census of the lepers in Norway which exhibited an increase, and created considerable anxiety, was that of 1836, when the number of lepers was found to be 659, all of whom, with the exception of three individuals, inhabited the western coast, from Stavanger to Hammerfest. Again, in 1845, during the general census of the kingdom, the number of lepers was carefully ascertained, and not less than 1122 were returned as afflicted with the disease, of whom only twelve resided out of the limits before alluded to. The population in 1845 was 1,400,000, or about half that of London at the present day. In 1853, the last census of lepers was instituted, and the returns from the district physicians raised the numbers to 1782. The increase during these last seventeen years has therefore been nearly 255 per cent., and allowing for greater care at each census, it is impossible to shut our eyes to the fact that, during the last thirty years, the disease has fearfully increased. The number of applicants for relief at St. Jorgen's Hospital, in Bergen, has likewise in that period greatly augmented. To what cause, then, must this sudden increase of lepers in one particular locality—viz., the west coast of Norway, from Stavanger to Hammerfest, a distance of about 800 miles—be attributed?

When, in 1847, the elaborate work 'On Spedalskhed,' the result of the joint labours of Dr. Danielssen of Bergen, and of Professor W.

Boeck of Christiania, was published at the expense of the Norwegian Government, the doctrine therein maintained—that the spedalskhed is a thoroughly hereditary disease, and not contagious or acquired from external causes—seems to have been by most writers unhesitatingly accepted. It was the general belief, too, that the great diminution of the disease, and its extinction in some countries, had resulted from the numerous foundations for lepers that, in the fifteenth century, were to be met with in almost every part of Europe. Consonant with this view, it was resolved by the Norwegian Government that a hospital for the treatment of lepers should be erected at Bergen, and accordingly, in 1849, the Lungegaards Hospital was appropriated to that purpose, and was placed under the superintendence of Dr. Danielssen.*

Of the talents of this well-known physician—of his unwearied zeal and devoted attention to the study of the disease in question—it is unnecessary for us here to speak; suffice it to say, that in this hospital almost every species of treatment has been perseveringly tried, but that as yet medicine seems to have but little power in arresting the progress of the spedalskhed. When we visited Bergen in 1856, Dr. Danielssen informed us that he had obtained the *most* satisfactory results from frequent cupping, and with large and long-continued doses of tartrate of antimony. The Lungegaards Hospital, however, exists no longer. On Christmas-night, 1853, a fire broke out in the building, and, horrible to relate, four of the poor inmates perished in the flames, while at least four others subsequently died from exposure to cold and the shock to their debilitated systems. The hospital had been originally intended for eighty patients, though we believe the full number was never within its precincts. The inmates of the institution were chiefly supported by the parishes that had sent them thither, and by a small contribution from the Government. The results of this experiment seem to have been by no means satisfactory. The number of cures has been remarkably small, and the time required for the full treatment of each case appears extraordinarily long. We do not mean, however, by this to cast any blame on the excellent physician at the head of the establishment. Dr. Danielssen has devoted his whole time and attention to the study of the disease, and if the results of treatment are not favourable, the details given show that no labour, no trouble, has been spared, either by the physician or by the other attendants. Of 148 lepers treated in Lungegaards Hospital up to the close of the year 1853, only fifteen have gone out as cured; and in regard to these fifteen, the time that has elapsed since they left the hospital is too short to give a certainty of the disease having been eradicated from their constitutions.

Immediately after the destruction of the hospital by fire, a committee was appointed to consider the best mode of restoring the building, so as to render it of the greatest utility to those afflicted with spedalskhed. This committee came to the conclusion that it was unnecessary to continue the experimental treatment of spedalskhed upon so large a scale as had hitherto been attempted, and that it did not appear probable that treatment would have any marked effect in arresting the progress of the disease. They proposed, therefore, to rebuild the Lungegaards Hospital on a different plan, allotting only forty to fifty beds to the special treatment of the disease, and diverting the rest of the funds to the formation of an asylum for lepers, which, however, was to be under the same roof and direction as the clinical hospital before alluded to. In recommending this arrangement, the committee acted in opposition to the opinions of Danielssen, Boeck, and Hjort, all of whom were in favour of retaining the original plan; and one (Dr. Hjort) urges that the hospitals should even be increased in number, so that three medical men may compare together the results of their treatment. It is plain, then, that the committee regard the eradication of the spedalskhed by medical treatment as a very doubtful question, and that in all probability the opinions of medical men as to the causes of the increase of leprosy have recently undergone considerable modification. It will be remembered that Boeck and Danielssen have all along maintained that leprosy is a thoroughly hereditary disease—that it descends from generation to generation—and that *this* is the chief cause of its wide-spreading ravages. They state, also, that the malady in this respect presents certain peculiarities—that, for instance, it descends more by the collateral branches than by immediate succession, (!) and that it also frequently skips over one, two, or three generations, to reappear with fearful severity in the fourth. We confess that these asserted peculiarities in the course of the disease have always appeared to us open to objections, nor have we been able to understand why the leprosy should have so greatly increased within the last thirty years if it was a malady that was propagated only by hereditary transmission. To this question we shall again return; but so strong was the general belief as to its hereditary character, that various measures were proposed to hinder the leper from continuing his species. Dr. Hjort, who has ever been an active opponent of the doctrine of hereditary transmission, tells us that at least three measures have been discussed, though only one of them has been actually laid before the Storthing or Norwegian Parliament.

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* The condition of St. George's Hospital, in Bergen, seems to have remained almost unaltered for hundreds of years till the subject was taken up by the Storthing in 1836, and a Royal Commission was issued in Sept. 1837. The Report of the Commission (Dec. 1838) was to the effect that institutions for the treatment of the disease, as well as asylums, ought to be provided. In 1842 the Storthing determined to devote 18,500 dollars to the erection of a hospital for the cure of leprosy in the town of Bergen, and in 1849 the Lungegaards Hospital was ready to receive patients.

The *first* proposal was to isolate all the lepers, by enclosing them in asylums, as was done in the middle ages.

The *second*, to prohibit the marriage of all lepers, and of their immediate descendants.

The *third*, to deprive all the male infants of leprous parents of the power of continuing their species, by ligature of the vasa deferentia—an operation supposed to be unattended with danger to life!!!

It is needless to observe that this last was never made public, and probably was never seriously entertained by any sane individual. The first proposal was likewise withdrawn, from the fear of the enormous expenditure that would thereby be entailed on the country, if asylums had to be prepared and maintained for all those labouring under leprosy.

The second proposition was, however, actually laid before the Storthing in 1854; for a programme of a law forbidding lepers to marry was actually read before that assembly during their recent sessions. The proposers of the law themselves allowed that it was open to the most serious objections, and it met with the most resolute opposition from four of the bishops of the Lutheran Church, while the other prelates only submitted to its introduction on the grounds of absolute necessity, and that no other more humane means could be thought of. To the honour of the Storthing, the proposal was rejected, though only by a small majority; but the very fact of its having been brought forward shows how implicitly the hereditary character of the disease was regarded as a settled question in the affirmative.

> "Is it, then," observes Dr. Hjort, "an established fact—is it absolutely proved to a demonstration—that the spedalskhed is propagated principally by hereditary transmission, and that this is the chief cause of its serious increase within the last thirty years on the western coast of Norway? and is it come to this, that we really have no other efficacious means of arresting the disorder than those above alluded to?
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> "From time to time, the relationship to each other of many hundred lepers has been carefully investigated, and the result has been that many of them have been found to be more or less akin to each other, and from hence the conclusion has been arrived at, that the disease was hereditary in all those lepers who were related to others labouring under that disease. It will be plain to all that this conclusion does not rest on a sound basis, and that a malady can only be inherited in one way—viz., that the seeds thereof should pass from parents to their children in a direct line, while those persons who are only collaterally related cannot inherit disease one from another.
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> "When both parents and children become leprous at the same time, we may reasonably conclude that the children have not received the disease from their parents, but that the malady has arisen, in both parties, from external causes common to both. To prove that the children have inherited the disease from their parents, we must be able to show that the parents were affected with spedalskhed at the time of the procreation of these children." (p. 654.)

Dr. Hjort thus contests the accuracy of Boeck and Daneilssen's conclusions relative to the hereditary character of the disease. These authors had expressed themselves so positively on this subject in their joint work on spedalskhed, that it seemed in their opinion to supersede all other causes whatsoever. If spedalskhed, however, is a purely hereditary disease, it is singular that it does not show itself in early youth, as congenital syphilis almost invariably does. It is only when the patient reaches the period of puberty, and generally later than this, that the leprosy develops itself. We may observe that the enormous advance of leprosy during the last thirty years in Norway, cannot be explained by hereditary transmission alone; and indeed this theory gives us no aid whatsoever in accounting for its unwonted increase.

Contagion is denied both by Hjort and by Danielssen and Boeck; but Hoegh, in his Report on Leprosy in Norway for the year 1855, seems inclined to admit of a secondary infection through the acarus scabiei, which is so frequent on the skins of lepers. The general prevalence of cutaneous diseases, and especially of scabies, on the western coast of Norway, has been remarked by most travellers; and Hoegh suggests that the cases in which the evidence of the disease being transferred from patients to those who waited upon them is very strong, are possibly to be accounted for in this way. The crusts and horn-like elevations that in many cases of spedalskhed cover the arms and face, are now found to be composed entirely of the remains of acari closely agglutinated together; and on removing forcibly these crusts, living acari are to be found on the ulcerated surfaces beneath. We must acknowledge that at the present day there are few writers acquainted with the disease who seem inclined to admit of contagion as an agent in the diffusion of leprosy, but the cases brought forward by Hoegh seem worthy of attention.

An important list is given in the Report of thirty-five lepers, in Förde parish, in the North Bergen district. In one family at Flugedal, a farm lying nearly 2000 feet above the sea level, there appear to be strong reasons for suspecting contagion. The father had never had any relations affected with leprosy; on the mother's side the disease was likewise unknown. The eldest daughter, aged twenty-five, associated with a leprous girl of the neighbourhood about eight years before, and a year afterwards became affected with the disease. Her sister, who slept in the same bed with her, has been a leper for three years and a half, and the brother, aged fifteen, has had the same malady for two years. None of the members of this family had suffered much from cold or insufficient food. Finally, the mother became affected about nine months before she was seen by Dr. Hoegh. All the family were affected with itch to a great degree. Such a case does not necessarily imply contagion; the external circumstances may have changed, which influence the development of the disease.

To these external circumstances we beg leave now to call the reader's attention.

> "After having thus duly considered the grounds," says Dr. Hjort, "upon which is based the general opinion that the spedalskhed, in the great majority of instances, is propagated and spread by transmission from generation to generation; and after having, we trust, shown that the external causes have been entirely passed over, under the influence of this theory, I shall now state a few facts which, in our opinion, are directly contradictory to this popular belief. The attempt to explain by its hereditary character the enormous increase of spedalskhed on the west coast of Norway during the last thirty years, cannot be anything but a failure. The tendency to hereditary transmission may be believed to be at all times present in an equal degree, and it may therefore be concluded that it will produce at all times a regular increase of the malady. The leprosy, however, had for centuries remained on our west coast in nearly the same condition till within the last twenty years or so; it has suddenly increased, and this increase has been in so enormous a proportion (60 per cent. in sixteen years) that it cannot depend upon causes which have always been in operation, but the cause must be sought for in some fresh influence, either upon the disease or on the inhabitants. I believe that this influence—this fresh and powerful cause of the malady—exists in the great sea fisheries

which, within the last thirty years, have been so greatly extended on our coasts, and exactly on those parts of the coast where the spedalskhed is the most prevalent. That the sea fisheries and the mode of life consequent on this pursuit is one of the most powerful, if not the most important cause, of the spread of this disease, may be presumed also from the information we have obtained from other countries. In the last century there were large herring fisheries on the coast of Bohuslän (Sweden), and at that time spedalskhed was exceedingly common in that district; but after the herring shoals in 1807 left the coast of Bohuslän, and showed themselves on the Bergen side of the country, the leprosy almost entirely ceased on the coast of Sweden, so that in 1837, when I visited the hospital at Uddevalla, there was hardly a single leper to be found there. The disease, however, accompanied the herring shoals to the Bergen coast, for it is precisely from that time that the spedalskhed has increased so remarkably in our western coast districts.

"We learn, also, from the Faroe Isles, that the disease has there diminished, and is now almost unknown, since the great sea fishings were relinquished, and more attention was paid to agricultural pursuits." (p. 665.)

The connexion of spedalskhed with the hardships of the deep-sea fishing is also insisted upon by Schleisser, in his Medical Report on Iceland (1849). After noticing the rapid decrease of the disorder in Iceland, he continues:

"I wish to call attention to the remarkable circumstance, that upon the whole east and north coast—tracts of country where no fishery is carried on—very few lepers indeed are to be found, while one-third of the whole number in the island are to be met with in Guldbringe Syssel, and there principally in one parish, where the principal fishing-stations are situated." (p. 22.)

The extent to which these fisheries are carried on in the north of Norway, and the privations endured by the fishermen, are well set forth by Dr. Danielssen in his excellent little popular description of the disease and of its causes. And here we may observe, that the writer evidently in 1854 allows much more influence to external causes than he was willing to concede in 1848, though he has by no means as yet given up his doctrine of the hereditary character of spedalskhed, if we may judge from the following lines:

"When the spedalskhed has once found its way into a family, it spreads itself on every side, and that in so fearful a mode that no member of the family is secure from it. True it is that occasionally the disease appears to have died out in a family, since two generations in succession are occasionally seen to escape the disease; but this cessation is only apparent, and not real: it is but a calm followed by a storm which breaks out with tenfold fury, attacking the third and fourth generations with great intensity; for leprosy, when left to itself, never dies out: it follows its prey through successive generations, even to the last scion of the race. This hereditary character is to be regarded as the internal cause of spedalskhed; it is the cause the most to be feared of all; for the disease often steals unnoticed into a family, and then it never leaves them.

"I come now to the external causes.

"Spedalskhed is essentially a disease of the sea coast, and if it appear further inland it is to be observed along the course of rivers, or on the borders of lakes. In our own country the great localities for the disease are the deep fiords and islands that are found on our western coast, and which give to that coast its peculiar character. The larger of these islands are deeply intersected by the ocean, forming inlets and bays, while the fiords run up for many miles inland,

> and form a number of secondary inlets, around which the population of our western coast, which is chiefly engaged in fishing, has located itself. The air on the banks of these fiords is damp, and constantly loaded with sea-fog; throughout the whole winter the cold is intense, and in the deeper inlets mist obscures the atmosphere to an extraordinary degree. In autumn, the sea-fogs (*havskaadda*) appear in the narrower fiords, and often remain there for many months. The ground is occasionally clay, and always everywhere swampy; but in very few places are any beds of sand observed. Stagnant waters, especially as swamps, are exceedingly common, and the drinking water is in many places exceedingly hard, and in dry summers and hard winters it is scarcely potable. Often, when staying on some of the smaller islands, have I been obliged to send for water the distance of a Norwegian mile (seven English miles), for the water of the island, though generally used by the inhabitants, was to me perfectly intolerable." (p. 9.)

In spite of the abundance of water in most parts of Norway, we rarely see the attention paid to obtaining a good supply of water that is observable in Switzerland or in the Tyrol.

The dwellings of the people are in general small, and the windows of the most diminutive size. The price of glass in Norway is very high, and, although wood is plentiful and building extremely cheap, the large expenditure for glass prevents, perhaps, the dwelling-rooms being made of large size. Moreover, the windows are almost always nailed down, so that they are never opened throughout the year, and thus the house is not aired, nor the floor swept, for the space of a twelvemonth. In many cottages additional warmth is provided by a dog, and perhaps also a pig, which inhabits the chamber where the family cooks and sleeps, and contributes still more to poison the atmosphere.

Dr. Danielssen insists much upon the misery and cold endured by the girls and boys when tending cattle on the mountain pastures during spring and autumn. This period of the Norwegian peasant's life, from the tenth to the sixteenth year, is one undoubtedly of peculiar hardship. The children are wretchedly clothed, and for months together they go barefoot amid the melting snows of the upland pastures, as they follow the receding snow wreaths for the sake of the fresh grass that springs up immediately on their disappearance. The period for 'herding' the flocks on the mountain pastures is from the middle of April to the end of October, and during this period the boy or girl who tends the cattle is exposed to the bitter storms that sweep over the great Norwegian plateau, to the drenching rains of the summer, and the heavy mists of autumn. Rarely have these children any change of raiment; they often for weeks together sleep in clothes that have never been dried. We cannot, however, accept this as a direct cause of spedalskhed, as in that case the disease ought to be as frequent on the east side of the plateau as in the fiords that intersect it on the west. Nor has anything occurred of late years in respect to this mode of life to account for the sudden increase of the leprosy on the western coast; the cattle have been driven up to the '*saeters*' from time immemorial, and the same hardships have been endured by the children who tended them. Of the uncleanly habits of the Norwegian peasantry we shall allow Dr. Danielssen to speak, and from personal observation we can most fully confirm all that he says, with the addition, however, that these habits are not confined to those localities where spedalskhed is to be found.

> "Uncleanliness is one of the most offensive faults of our maritime population, and it seems to pervade everything. Not only is it to be met with in the houses, but the domestic utensils, the clothes, and the bodies of the people themselves, are covered with filth. In the narrow, unventilated chamber where the whole family lodge—where they eat and sleep, and cook all their victuals, and dry their damp garments—the amount of dirt is, in many places, almost incredible. Rarely is the floor swept, and weeks and months may pass without its being washed. The clothes in daily use, the trousers, shirt, and drawers, which are always of woollen, are rarely, if ever, cleaned: the dirt dries upon them, and increases day by day. And with regard to the body itself, the face and hands are washed perhaps twice a week, and the feet twice in the year; but the rest of the body is untouched by water from infancy to the extreme of old age." (p. 13.)

We have already briefly alluded to the extension of the winter sea-fisheries as the probable cause of the increase of spedalskhed. The sufferings and hardships of the fishermen at this inclement season of the year are well depicted by Dr. Danielssen:

> "I avail myself of this opportunity of referring more at length to the great sea fisheries which take place at certain seasons of the year, and this because the mode of life of those engaged in these labours has no little influence in the production of various maladies, and of leprosy in particular. The spring herring fishery commences in the beginning of the month of January, and usually lasts till the end of March. During this the very hardest period of our northern winter, a great number of men assemble at the so-called fishing-places (*fiskevaer*), in the vicinity of the localities where the herrings are found. So far from suitable buildings being provided in these places for the accommodation of the fishermen, there is, on the contrary, the greatest possible deficiency of proper dwellings, so that many, in this inclement season, are forced to spend the night on the bare ground, under an upturned boat, or under a sail set up as a tent. In the few 'lodges' that are to be obtained, they have indeed a roof over their heads, but nothing more. In one small hut a great number of men are packed together, lying side by side upon the floor, and many sleeping in their wet clothes. After the lapse of a few hours the condensed vapour drops from the roof and walls, and the air is so filled with steam and the exhalations from so many individuals that it is hardly fit for the purposes of respiration. It is with the greatest difficulty that clothes can be dried in such places, and, as a matter of necessity, cleanliness is totally neglected. Of late years, some old vessels have been fitted up as 'lodges,' but with no better result, as they are over-crowded, like the huts. The fishermen spend the greater part of the day on the sea, exposed to cold and sleet, and often half frozen in their boats. On coming ashore they are too apt to have recourse to ardent spirits, in the hope of regaining the animal warmth they have lost.
>
> "The summer and autumn herring fisheries occur at a more favourable period of the year, so that the men are not exposed to such severe hardships."

But it is in the great winter cod fisheries on the Loffoden Isles that the Norwegian peasant endures the greatest sufferings. The cod fishery around these desolate islands commences with the month of February, and lasts till the middle of April. At this period not less than three thousand five hundred boats, each with six men, assemble at the fishing-stations on the Loffoden. The few travellers who have visited these isles have been struck with their hideous desolation, even in the midst of summer; but their aspect in winter, in that far northern latitude, beyond the Arctic circle, has been witnessed by few but the hardy fishermen themselves. Of late years, as we learn from Hoegh's Report, much smaller boats have been used for the purpose than before, and the consequences have been most disastrous to the health of the crews, however profitable such a change may have been in a pecuniary point of view. In these small boats they make their winter's voyage to the Loffoden, crossing the deep fiords, and buffeting with the waves, till they reach their destined station, and many boats' crews have never had dry clothes to put on from the day they left their homes till their arrival in the Loffodens—a voyage often occupying two to three weeks.

> "This enormous body of men thus collected on islands almost uninhabited at other periods of the year, are necessitated to accept of such accommodation as they can get, if they do not choose to lie on the bare ground in the open air,—and yet, from the greediness of the landlords, the lodges are of the most miserable character. A lodge (*logisbod*) is about eight or nine ells in length, seven to eight ells in breadth, and three and a half or four ells in height. The floor is of earth, and the beds are of boards laid along the walls, and accommodating, if we can so use the term, not less than twenty men in each lodge. In the centre of the floor is a species of hearth, formed of stones, with slabs on the sides to prevent the fire from falling out. There is no chimney, but merely a hole in the roof to allow the smoke to escape. In this contracted space these twenty men cook, and eat, and sleep, and dry their clothes. Cleanliness is never thought of, the floor is never swept, but all sorts of filth are allowed to accumulate upon it." (p. 15.)

Of the insufficient food of the peasantry at all times it is unnecessary here to speak; but we may be allowed to make another short extract from Dr. Danielssen's admirable little pamphlet, relative to the mode of preparing fish, especially herrings, which form so large a proportion of the daily nourishment of the maritime population:

> "Herrings are generally used in a salted state, rarely, if ever, are they eaten fresh. But the greater part of these salted herrings are exceedingly ill prepared for the table. The peasant of the western coast is so little delicate about this article of food, which forms so large a proportion of his daily sustenance, that he often devours the herring in a putrid state. Where the herring fishery happens to be in localities where assistance is not at hand, such as is often the case to the north of Bergen, a large number of the herrings are thrown on shore, and are left there for many days waiting for purchasers. Should these not appear, or should they refuse to take the fish on the ground of their being old and stale, the peasant then appropriates them to his own use, and, adding a small quantity of salt to the half-rotten herrings, he conveys them home. After the lapse of some weeks these herrings are, in a manner, pickled—that is to say, they are sour (half rotten), and then they become the daily food of the whole family. Each week until they are consumed they become more and more decayed, but nevertheless the nauseous food is eaten till not a herring is left. Nay, so constant is this hateful custom among the peasantry, that they will not touch fresh fish, but prefer to leave it for some days, until incipient decay gives it a zest for their coarse palates." (p. 16.)

Throughout the whole of Norway, as we can vouch from personal experience, the food of the peasantry, and even of the better classes, is far from good; and on the west coast, especially in those districts where leprosy prevails, it is unequivocally bad. Flesh meat is rarely, if ever, tasted by the Norwegian peasant, except it be in a salted state, and it is the pride of the Norwegian peasant to accumulate hams and flitches, and other salted meat, which he hangs up, year after year, in his dwelling-house, as evidences of his wealth.

The facts that we have brought forward relative to the fisheries on the western coast, and the simultaneous increase of leprosy with their augmentation within the last thirty years, will perhaps be regarded by many of our readers as admitting of considerable doubt as to the influence of these fisheries in spreading the malady alluded to. That it has fearfully increased of late cannot, we think, be denied; but it may be that the causes of its additional virulence lie deeper than those that we have endeavoured to point out. Under any circumstances, we must regard the exclusive hereditary theory as untenable, even though supported by the great authorities of Danielssen and Boeck.

Since the foregoing pages were written, we have received the Report of the discussion in the Medical Society of Christiania on the project of a law to prevent the marriage of those affected with leprosy. Although this proposed law had been rejected by the Storthing in 1854, it was still the opinion of the Royal Commission that it should be again brought forward, and in all probability it would have occupied the attention of the Storthing now sitting, had it not been for the discussion here reported. The arguments on either side seem to have been carried on with great spirit, occasionally, perhaps, with a little too much of personal feeling; and the care and attention devoted to the subject may be judged from the fact that the discussion was continued almost weekly for upwards of four months. The whole subject of the management of lepers, both sanitary and parochial, seems to have been fairly considered; but the discussion seems to have originated in the wish of some of the members of the Commission to defend their cause against the attack made upon them by Dr. Hjort in the paper noticed in the foregoing pages. It will not be possible for us to detail in the compass of a page or two the various arguments employed by the assailing or defending party; suffice it to say, that although at first Dr. Hjort seemed to stand almost alone in his views, yet his able defence was powerfully seconded by Egeberg, Preus, and others, and, in the end, Professor Faye announced that the Commission would not, after what had passed, recommend the Government to bring the law again before the Storthing.

With regard to the law itself, there will, we think, be but one opinion among our readers—viz., that it is a retrograde enactment unworthy of the present day, and most unlooked-for in a country such as Norway, where the rights and personal liberty of all are so uniformly respected. We should not have expected such a measure from the most despotic government in Europe. Bad as the proposal seems, it is rendered still worse when we reflect that the very grounds on which it rests—viz., the hereditary character of spedalskhed—are open to serious doubt. Not only is this a doubtful doctrine, but the arguments of Dr. Hjort and others go far to prove that this opinion is actually false and illusory. Even if it were true, it would still be a question whether the Government is justified in thus depriving a large proportion of the community of their civil rights. The law against the marriage of lepers would directly affect at least two thousand individuals—for that is the present number of lepers in Norway—while indirectly it would invade the civil rights and liberties of at least seven thousand persons more. As to its efficacy, a law prohibiting the marriage of lepers has existed in Iceland for the last ninety or one hundred years, and yet within the last twenty years the malady is on the increase. The advocates of the Bill say that this, no doubt, is in consequence of the provisions of this law not being carried into effect; but what guarantee have we that an ordinance so rigorous, so repugnant to the spirit of liberty inherent in every Northman's breast, would be better observed in Norway?

The observations of Heyerdahl bear strongly on the point alluded to:

> "It appears to me," he remarks, "that the medical committee has, by its proposed prohibitory law, enlisted itself too far on the side of the Government, without taking sufficiently into consideration the rights of the lepers themselves as the other interested party. The project of the law is based solely and entirely on the hereditary character of the malady as the principal source from whence the disorder is spread throughout the land. Upon this question of hereditary transmission the law must stand or fall. No one, indeed, doubts that the disease may be inherited; but what must be proved is, that the disease is inherited to such an extent as to exclude, in a great measure, the influence of other causes (such as contagion, or external circumstances). The medical committee has, indeed, shown a certain probability in favour of their assertions, but I cannot admit that their tables exhibit the highest degree of probability in their favour. But the utmost possible proof is, in my opinion, required—nay, is to be demanded—by the leper, before a law is passed which makes so serious an inroad on his personal liberty. If the leper had belonged to the privileged and educated classes of society, the medical committee would never have dared to propose such a law against their rights upon so slender a foundation. But the leper is not one of the educated class—his voice has not, therefore, been heard: in all probability he scarcely knows the projects that are being hatched against him." (p. 64.)

In Norway, during the last two or three years, much has been done to improve the condition of another class of patients—viz., those afflicted with mental disease. A magnificent asylum has recently been constructed for them at Gaustad, near Christiania, while for the lepers much remains to be accomplished.

> "Up to this time," observes Dr. Hjort, "the lepers in Norway have not been persecuted or ill treated, as was too often the case in the middle ages, but for hundreds of years they were almost totally neglected, until within the last few years, when the Government and the Storthing recognised their claims, and agreed to erect hospitals and asylums for their use. Shall we, then, at the present day, continue this work of benevolence, or shall we have to recur to the practices of the middle ages? Shall we, with reference to these unfortunate individuals, follow the course that we have adopted towards the felon and

the lunatic, or shall we revert to the barbarism of mediæval times? This is the real question before the Medical Society. Other countries have shown us how to treat the lunatic and the felon, and we have readily followed their example. We have no precedents to guide us in the treatment of the leper, but if Providence has placed this disease in an especial degree in our country, it becomes us to see if we have received this infliction in a proper spirit—in a spirit consonant with the enlightened views of the age. Since spedalskhed is a Norwegian malady, the Norwegian medical practitioners are, in an especial manner, called upon to study its symptoms, and seek out the means of cure. The disease is one link in the great chain of dyscrasic maladies, and by ascertaining its true character we throw light on all other cognate disorders." (p. 78.)

At the meeting of the 1st of April, 1857, Egeberg stated that there was reason to believe that many of the local causes of spedalskhed might be removed if the people were properly instructed, by an intelligent medical man, in better hygienic and sanitary principles. Egeberg announced that he had already obtained a sum of 1800 specie dollars for the purpose, and that Candidat. Medicin. Bidenkap had undertaken the task for the next two years. In all probability, at the end of that period a very interesting report may be expected from the above-named gentleman.

Dr. Hoegh supplies us with a brief account of the mode in which the lepers were enumerated in 1856. The district physicians called together the Commissioners of Health, and required them to make up a list of the lepers in their separate divisions, and to hand them to the district physician. The total number of the lepers in 1856 was 2000, while in 1853 they were 1647, and consequently there was an increase of 354. In 1853, however, the census was incomplete. By comparing the lists of 1853 with those of 1856, it is plainly seen that this increase is only an apparent one. In reality it seems that in 1856 there were fewer lepers by 74 individuals than in 1853. In North Trondhjems district there were 18 more than in 1853; in Christiania *Amt* (or district) there were none in 1853, but 12 in 1856; but out of these only two were fresh cases. The proportion of the sexes afflicted was as 50·2 of the males to 49·8 females; but this proportion did not hold good over the whole country. To the north of Romsdals *Amt* the males were in excess, especially in Finmark, where, however, the total number of lepers was but small. The excess of male lepers over females was most marked in Upper Trondhjems *Amt*, where undoubtedly the highest degree of cultivation exists, and where the lot of the female is less hard than in any other part of Norway. To the south of Romsdals *Amt* we have an excess of females, and Hoegh believes that the proportion depends much on the amount of labour and privation undergone by the female sex in the various districts.

Although the malady chiefly prevails in those districts on the west coast, where the greatest amount of misery and dirt are known to exist, still there are many valleys where no lepers are to be found, and yet which exceed all others in the poverty and filthy habits of the inhabitants. It seems, too, that several persons have become affected with leprosy who have removed from inland districts to the western coast. In such cases hereditary transmission could not possibly have produced the disease. In the enumeration of cases above referred to, it seems to us an important omission that no attention has been paid to the question whether those affected with leprosy have been much exposed to privations, especially to the severe sufferings endured in the winter cod fishery at the Loffodens. Perhaps this may serve to explain many of the apparent discrepancies. It is evident that the privations endured in herding cattle on the mountain pastures cannot be regarded as a sufficient cause, or the malady would prevail on the eastern side of the great Norwegian plateau as well as on the west. If the malady spread by inheritance alone, how has it died out within the memory of man on the western coast of Sweden (Bohuslän)? The families that at the beginning of the present century were leprous there are still upon the spot, but the spedalskhed has disappeared. Holmsen, in his Report, mentions several places which he considers to be "foci" of leprosy, where the disease has shown itself—has increased—and then gradually died out again, while the same families continued to occupy the land.

The conclusions at which we have arrived after an attentive perusal of this interesting Report, may be summed up as follows:

1. That a decided increase of the disease has taken place in Norway during the last thirty years.
2. That hereditary transmission will not account for this increase.
3. That the data hitherto obtained are insufficient; that the hygienic condition of the people must be more accurately studied, and the relations between sufferings at the winter fisheries, or in herding cattle on the mountains, and the prevalence of leprosy, must be accurately laid down.
4. That the proofs of the hereditary character of the disease are quite insufficient to justify such a restraint on the liberty of the subject, as is contemplated by the proposed law against the marriage of lepers.
5. That the project of compelling all the lepers in Norway to enter asylums built and maintained for that purpose, would be a still more direct infringing of the liberty of the subject than the aforesaid law against the marriage of lepers, while at the same time it would virtually enforce the latter proposal by incarcerating the leper for life, and depriving him of all chance of entering into the married state.

REVIEW V.

1. *Official Army Register for* 1856. Published by order of the Secretary at War, in compliance with the Resolution of the Senate, of December 13th, 1815, and Resolutions of the House of Representatives, dated February 1st, 1830, and August 30th, 1842.—*Washington*, 1856. 8vo. pp. 56.
2. *Statistical Report of the Sickness and Mortality of the Army of the United States, compiled from the Records of the Surgeon-General's*

Office; embracing a period of Sixteen Years, from January, 1839, *to January,* 1855. Prepared under the direction of Brigadier-General Thomas Lawson, Surgeon-General, United States Army. By RICHARD H. COOLIDGE, M.D., Assistant-Surgeon U.S. Army. —*Washington,* 1856. 4to. pp. 703.

3. *Report on the Vital Statistics of the United States, made to the Mutual Life Insurance Company, of New York.* By JAMES WYNNE, M.D., &c.—*New York and London,* 1857. 4to. pp. 214.

THIS, we believe, is the first time that an army-list has appeared in the heading of an article in this Review. The titles of the works which follow it may denote why it has had a place; and we beg to offer assurance that the use we shall make of it will be strictly in subordination to the more legitimate professional subjects indicated by the latter works. The few preliminary remarks we have to offer we hope will not be considered exceptional.

There is commonly a decided relation between the military force of a people and the character of a people as a nation: the one is more or less an exponent of the other. There may be exceptions; but we know of none; and certainly the army of the United States is not one. It is, we think, specially distinctive and characteristic of that great loosely-united and somewhat anomalous republic—a republic so composite in its nature; jealous of its liberties, yet more than tolerating slavery; frugal in its expenditure, and yet too often *alieni appetens* repudiating its obligations; and with land in excess, by all means, *per fas et nefas,* so intent on national and territorial advancement.

From their Army Register it would appear, that whilst the permanently embodied force—the regular army at the service of the States Government—is only 12,698 of all arms,* the militia of the several States is of the vast amount of 2,421,163; the former with a staff, including the civil departments, not exceeding 302, with only four general officers—viz., one major-general and three brigadier-generals; the latter with a staff in itself numerically equal to the whole of the standing army, amounting, as it does, in general officers, general staff-officers, and field officers, to 12,696.

Like our own army, that of the United States is formed on the voluntary principle, and is so recruited. The period of service is limited, and to five years. None are enlisted under the age of eighteen, or over thirty-five years; or, as to height, under five feet four inches and a half. None are passed without an examination, the examining surgeon having to declare on his honour that the recruit approved is "free from all bodily defects and mental infirmity any way disqualifying him from performing the duties of a soldier." The number rejected shows, at the same time, the careful and conscientious manner in which the duty is performed by the examining officer, and the bad description of men who present themselves for the service. They are described, in time of peace, as "consisting principally of newly-arrived immigrants,—of those broken down by bad habits and dissipation,—the idle and improvident." Yet, strange to say, it was from such that our Government, at the breaking out of the war with Russia, authorized the attempt to increase our military force by foreign levies, even at the risk of interrupting the friendly relations between the two countries! Of 16,064 men of this description examined in 1852, the numbers enlisted were 2726, the numbers rejected 13,338; and of the 5000 enlisted during the years 1850 and 1851 more than two-thirds were foreigners, 1484 only being native Americans. It may be interesting to the reader to know who these foreigners were. They were (we quote from the medical statistics):

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* According to the latest information, it is now, owing to the Mormon war that is threatening, augmented to 15,764 effective men.

From Ireland	2113	From Denmark	7
„ England	306	„ Norway	5
„ Scotland	126	„ Holland	9
„ Wales	8	„ Belgium	2
„ Canada	90	„ France	49
„ Nova Scotia	19	„ Switzerland	22
„ New Brunswick	13	„ Poland	16
		„ Hungary	19
Total from Great Britain and dependencies	2675	„ Italy	13
		„ Austria	5
		„ Spain	2
From Germany	678	„ Prussia	1
„ Sweden	12	„ Finland	1

The reasons assigned for there being so large a proportion of foreigners, and of so undesirable a character, are no doubt the true ones—viz., the large influx of immigrants, and there being, as a general rule, such ample remuneration and employment for mechanics and labouring men in the United States, and the inducement to enter the service so small, the pay low, and the nature of the duties arduous and dangerous. The main recommendations are those which tell on immigrants; the shortness of the period of service, and the opportunity of settling advantageously and of obtaining land, when and where discharged. The difficulty of obtaining recruits from the native population is qualified, it would seem, by the time, and is confined to a time of peace; in a time of war the difficulty, we are assured, ends. Thus, when there is excitement—when glory may be obtained, and perhaps booty—there is no want of Americans. We are told that on the breaking out of the Mexican war, as many as 200,000 offered their services to the President; and that in the war of 1812–15 the regiments were almost made up of Americans. This is a circumstance well deserving of record, and of being kept in mind.

The service on which the United States army is employed, we have mentioned—using the words of the compiler of the statistics—as "arduous and dangerous," even in peace. It is eminently so—as much, or perhaps even more, than that of our army, being chiefly a service of frontier outposts, the majority of these posts far from the abodes of civilized society, where they are deprived of all its pleasures, and are exposed to various privations and hardships; and, when taking the field, they have to contend with an ignoble enemy, follow him through his wilds, to endure fatigues to a degree trying even to the strongest constitutions; with the addition, in a large number of instances, of exposure to malaria under the disadvantage of indifferent quarters, and the disregard too often of sanitary measures.

The following table is instructive as showing what becomes of the recruit—or, in other words, as showing the waste of the army—the same distinctions being observed as to nationalities; and we think fully confirming, in the proportion of deserters, and of men discharged by order and by court-martial, the repulsiveness of the duties, and the indifferent character of the men:

"Expiration of service:—Americans, 549; English, 618; Irish, 664; Germans, 719; total, 2550.

"By order of A. G. O. [Adjutant-General's Office?]:—Americans, 171; English, 155; Irish, 141; Germans, 149; total, 616.

"By court-martial:—Americans, 63; English, 54; Irish, 53; Germans, 20; total, 190.

"Disability:—Americans, 260: English, 229; Irish, 259; Germans, 306; total, 1054.

"Died:—Americans, 193; English, 237; Irish, 226; Germans, 273; total, 929.

"Killed accidentally:—Americans, 15; English, 23; Irish, 27; Germans, 37; total, 102.

"Killed in battle and died of wounds:—Americans, 57; English, 49; Irish, 62; Germans, 62; total, 230.

"Deserted:—Americans, 692; English, 635; Irish, 568; Germans, 434; total, 2329."

The military force of a country—its regular army—may be viewed as a great experiment to test the qualities of a people, or, in the most general sense, the qualities of man—his energies and weaknesses, mental and bodily—what he can endure, and what he can accomplish, whether struggling with his fellow-men in battle, or with fatigue and climate and the varied incidents and accidents of active service. It is thus viewed that the military service is specially interesting to the medical inquirer, and that the statistics of an army become of value.

The territory comprised within the limits of the United States, with its variety of soil and climate, extending from the Atlantic across the wide continent of the New World to the Pacific, and from the almost Arctic regions to the almost tropical, is well adapted for the field of such an experiment as that we have just alluded to. In the work before us, tolerably in accordance with the physical geography of the United States, eight great territorial divisions are made, with certain minor sub-divisions. Belonging to the great divisions are the following: 1. The Northern Division, including that portion of the States north of the fortieth degree of latitude, and east of the Rocky Mountains; 2. The Middle Division, that portion between the thirty-fifth and fortieth parallels of latitude; 3. The Southern Division, that between the thirtieth and thirty-fifth degrees of latitude; and, in addition to these, the five following—viz.: Texas, New Mexico, California, and the Oregon and Washington territories—vast tracts newly acquired, mostly outlying, and far the greater part still in the state of their primitive wildness. These eight principal divisions are subdivided into regions, according to peculiar local or climatological features belonging to them, likely to have an influence on health.

It is in these several divisions and sub-divisions that the small army of the United States is located, broken up into numerous detachments, the number of forts and stations occupied by troops amounting to as many as 159. And of these very many are new, especially in the outlying divisions: and in consequence, the quarters of the men are mostly rude structures formed of logs; and too often, from the medical officers not being duly consulted, ill placed as regards heathiness of situation, ill drained and ill ventilated, reminding us of a like negligence in our own service.

Did our limits permit, it would be desirable to follow the author in his descriptive details; we must confine ourselves to the briefest sketch. We shall follow the arrangement he has adopted.

In the Northern Division, the first region is the coast of New England. It is chiefly remarkable for the humidity of its climate, with an average yearly fall of rain of about forty-one inches; for summers of moderate heat and winters of no great severity, the mean annual temperature of the several stations being 45·9°; of spring 42·8°, of summer 64·9°, of autumn 49·4°, of winter 24·4°.

The climate of New-York Harbour Region differs chiefly from that of preceding, in having a somewhat higher and more equable temperature throughout the year, and being more equable also in point of humidity. The mean annual temperature is given as 51·82°; that of spring as 47·84°, of summer 71·35°, of autumn 55·79°, of winter 32·29°; and the mean yearly quantity of rain as 43·65 inches, divided pretty equally amongst the seasons, the least fall being in autumn, even then amounting to 9·93 inches.

West Point, in this last region, situated on the bank of the Hudson, is deserving of special attention, being the seat of the Military Academy for the professional education of all the officers of the United States army. At the distance of fifty miles from the coast, and surrounded by hills varying in height from 600 to 1400 feet, its climate is somewhat colder than the corresponding coast; in other respects differing but little.

The North Interior Region, east of the Great Lakes, the next in order, is so far removed from these great bodies of water and from the Atlantic, as not to be influenced by either. Its chief characteristics are great dryness of air and a great winter cold, with a comparatively high summer temperature, sufficient for the ripening of wheat and Indian corn. Its spring average temperature is about 37°, its summer 62·4°, its autumn 40·6°, winter 13·8°; that of the year 38·3°. The range of the thermometer is extraordinary; in summer often above 90°, in winter occasionally so low that the mercury freezes: yet it is considered the healthiest of any part of the United States.

The next region, that of the Great Lakes, has its climate modified by them, especially in summer and winter; by "balmy breezes" from them at one season, and by cold and chilling blasts from their ice-bound surface in the other. Taking Fort Niagara, one of its stations, as an example, its mean annual temperature is 47·91°, its spring 44·83°, its summer 68·41°, autumn 50·59°, winter 27·81°.

One more region belongs to this division, the North Interior, west of the Great Lakes, lying between them and the Rocky Mountains and north of the fortieth degree of latitude. Like that of the region east of the same lakes, it is remarkable for the like peculiarities of climate—viz., severe winters, comparatively hot summers, mild autumns, and great vicissitudes of temperature, and also for a general salubrity. At Fort Gaines, Minnesota, in latitude 46° 19′, 1130 feet above the level of the sea, the average yearly temperature is 39·30°, its spring 39·33°, summer 64·94°, autumn 42·91°, winter 10°; with an average annual fall of rain of about 29·48 inches, divided amongst the seasons as follows: in spring 6·31 inches, summer 12·62, autumn 8·42, winter 2·13.

The second great division, the Middle Division, subdivided into Atlantic, Interior East, and Interior West, exhibits variety of climate almost as great as the preceding, especially as regards temperature and humidity of air. The Atlantic Region, under the influence of proximity to the sea, has a milder climate, one of less extremes than the other two, and one of greater humidity. Washington City, in latitude 38° 53′, that of the region being between 35° and 40° north, may be taken as an example. Its mean yearly temperature is 56·14°, its spring 55·77°, its summer 76·33°, its autumn 56·43°, its winter 36·50°. The mean yearly amount of rain is 41·20 inches, which is shared in a remarkably equal manner between the several seasons, ten inches falling in each. Snow is rarely seen, even in the depth of winter; and a vegetation more or less luxuriant, varying in kind according to the soil, is conspicuous throughout, not excepting its "pine barrens;" and for the most part it abounds in fruit-bearing trees—the fig, the grape, the apple, the pear—yet few of them attain perfection.

The Middle Interior Region East, lying between the Atlantic slope and the Mississippi river, and within nearly the same parallels of latitude as the last mentioned, is even more favoured in climate, having a somewhat lower temperature connected with its greater height (that moderate, above the level of the sea), and its distance from the sea, and also, owing to the same, a somewhat drier atmosphere.

The next region, the Middle Interior West, lying between the Mississippi and the eastern slope of the Rocky Mountains, and between the thirty-sixth and fortieth parallels of north latitude, may for the most part be described as a prairie country; and being remote from the ocean, and elevated, its climate is characteristically continental, marked by great vicissitudes of temperature and extremes of atmospheric humidity and dryness; and this, though the mean temperature of the year, and even of the seasons, and the total amount of rain, differ but little from those of the corresponding Atlantic coast. Fort Atkinson, exceeding 2000 feet above the level of the sea, may be taken as an example: its summer temperature occasionally reaches 90°; its winter cold is occasionallyso low as 12° below zero.

The South Division, divided into South Atlantic Region, and South Interior Regions, No. 1, No. 2, all between the parallels of 30° and 36° north latitude, exhibit differences of climate according with the position of each. That of the Atlantic Region is a near approach to a tropical climate, being almost beyond the limits of frost, admitting ot the cultivation of the sugar-cane. New Orleans may be given as an example, the mean yearly temperature of which is 69·86°; its spring 69·94°, its summer 82·27°, its autumn 70·71°, its winter 56·53°, with a fall of rain of 50·90 inches, pretty equally divided between the seasons, but most in summer. The South Interior No. 1, being but little distant from the sea and little elevated, has nearly the same climate as the preceding; but not so South Interior No. 2, for being more inland and more elevated, and in great part a prairie country, it is subject to greater vicissitudes: thus, at Fort Gibson, in the Cherokee nation, the thermometer in summer rises to 102°, in winter falling to 6°, with a mean yearly temperature of 61°; that of its summer being 79·41°, of its autumn 61·66°, of its winter 41·13°, of its spring 61·66°; with an average yearly fall of rain of 36·46 inches.

Florida, a vast promontory in the Atlantic, washed by the ever-flowing warm Gulf Stream, lying between the twenty-fourth and thirtieth parallels of latitude, has a peculiar climate, differing but little from an insular one in the same latitudes, and remarkable chiefly for the equability of its temperature and the moisture of its atmosphere. At Fort Dallas, where we are told the fig, the orange, the lemon, the citron, "blossom and bear the year round" ("The year round," we infer to be a poetical exaggeration),—the mean temperature of the year is 74·66°, of summer 81·50°, of autumn 76·27°, of winter 66·58°, and of spring 74·66°.

Texas, in point of climate, from the nature of its situation, differs much from Florida, and accords tolerably with the Middle South Division, lying nearly between the same parallels of latitude, and, like it, extending from the Atlantic coast to the inland prairies and mountainous regions. Most of the forts occupied by troops are situated towards the frontier of New Mexico, and in regions almost in a state of nature. Fort Davis, 4700 feet above the level of the sea, in a deep "cañon" of the mountains, a site selected for the purpose of protection against the severity of the winter, is a favourable example: the mean of its hottest month, June, is 77°; of its coldest, January, 37°; and there sudden changes of temperature are not so common as in other parts of the country.

New Mexico, one of the latest possessions of the United States, is described as little else than a great sterile mountainous desert, unfit for the abode of civilized man, and yet, like other deserts, having its oases. It is also described as one of the healthiest countries on the face of the globe. It is remarkable for the dryness of its atmosphere, the goodness of its water, and exemption from malaria; those fevers of malarious origin which appear in the reports, are all believed to be imported. The fall of rain is small, varying for the year, at different posts, from six inches to twenty. As might be expected, the range of the thermometer is great and the changes of temperature sudden.

Passing in one rapid glance from one side of the vast continent to the other over an immense tract, almost a *terra incognita*, yet doubtless about to become the seat of new States—one, indeed, already sprung up under the influence of the *auri sacra fames*, another under that of a more brutal lust, the polygamous principle—we come to regions even more peculiar in their climate than any that have yet been under our notice.

California is the first of these. Great is the contrast of the climate of its coast on the Pacific and in its interior; the one remarkable for mildness and equability of temperature, and for a humid state of atmosphere; the other for a high temperature and a great range of the thermometer. The humid state of the coast climate, it may be inferred, as the fall of rain is very small, is connected with fogs, which are frequent along its whole extent. We shall give a few examples illustrative of the contrast. Forts Yuma and St. Diego are nearly in the same latitude; the former in 32° 32′ north, the latter in 32° 42′. Fort Yuma about eighty miles from the sea, St. Diego about eight miles; the former about 355 feet above its level, the latter 140. The average spring temperature of the first is 72·10°, of its summer 89·69, of its autumn 75·69°, of its winter 56·80°, its mean yearly 73·62°; of the second, the spring temperature is 59·97°, the summer 71·26°, the autumn 64·43°, the winter 52·29°, the yearly 62°. The fall of rain throughout the year at Yuma is 3·24 inches; at St. Diego 12·20° inches. Fort Yuma has the reputation of being one of the hottest stations on the face of the earth, and it would seem not undeserved; the mean of July, the hottest month, in 1856, is stated as follows: at 7 A.M. 88·80°, at 2 P.M. 108·12°, at 9 P.M. 91·09°; average daily mean 95·36°, greatest heat in the shade 116°, least 80°. Monterey, situated on the beautiful shore of the bay of the same name, may be mentioned as another instance in the way of contrast. In latitude only about two degrees further north, so equable is its temperature that there is only a difference of about 6° between its winter and summer mean; its spring average is 53·99°, its summer 58·64°, its autumn 57·29°, its winter 51·22°, its annual 55·29°, with a fall of rain annually of 12·20 inches. Other instances hardly less striking might be given, illustrative of the difference of climate experienced in this region, depending on position, irrespective of latitude; but we must pass on to the last territorial division in which there are military stations—viz., the Oregon and the Washington territories, the limit of the United States northward, on the Pacific side of the continent.

Here again, as far as the partial meteorological observations made in those little explored regions allow of inference, there are much the same peculiarities of climate depending on position, as in the more southern; the stations on the coast being remarkable for equability of temperature and humidity of air, those distant from the coast for the reverse, but in a less degree. Astoria, a spot of some celebrity, one of the most northern stations in the Oregon territory, at the mouth of the Columbia river, and Fort Steilacoom, the most northern in the adjoining Washington territory, may be referred to as examples. Both are distinguished for equability and coolness of seasons, and a sufficiency of rain. The mean summer heat of the first is given as 61·58°, of the second as 62·39°; the mean winter temperature of the former as 42·43°, of the latter as 39·50°; with a yearly fall of rain of 51·75 inches. These are conditions of climate favourable to the grasses and green crops, rather than to the cereals and fruit-bearing trees, the heat of summer not being sufficient for the ripening of the grain or the fruit; and the vegetation of each is in accordance. One, and a remarkable circumstance must be mentioned, which is greatly in favour of these regions,—an almost total absence of annoying insects.

Brief as these notices are, we fear they may be tedious, but we have thought it right to give them, as without them such of the statistics of disease as we can transfer to our pages would be of little value. It is to these we must now ask attention.

The tables containing these statistics are drawn up in different forms, special and general; the former following the medical topography of the several posts comprised in the region, the latter as concluding summaries; and in the instance of each region the sickness and mortality from the more important classes of diseases are specially tabulated: these are, 1, fevers; 2, diseases of the digestive organs; 3, diseases of the respiratory organs. This arrangement in its several parts we consider a very happy one, and well adapted for easy reference, the great end of orderly arrangement. By means of it, in a few minutes the medical officer about to have charge of a post may make himself acquainted with the prevailing diseases of that post, and in a great many instances by the remarks prefixed descriptive of the station, aided by the meteorological tables appended, he may acquire a general idea of what is most remarkable in its locality and climate; information, this, which ought not to be less prized by the commanding officer or by the directing authorities at the War Office. And not only are they valuable in the manner thus alluded to locally and for a special purpose, but also in a large sense, as promoting the advancement of medical science.

For the tabular statements we must refer to the work itself. The results they give are well adapted to illustrate some of the preceding remarks, showing as they do the influence of climate, especially in the production of diseases belonging to the more important classes, the three already mentioned, and their fatality in different regions.

Consulting these tables, we see how in the first class of prevailing diseases, certain fevers prevail amongst the troops more at some stations than at others; and how the mortality varies, and that no wise in the same ratio as the amount of disease. The latter fact is shown by the following numbers taken from the Consolidated Abstract of Diseases:—

	Cases treated.	Died.
Febris continua communis	2,207	23
„ intermittens quotidiana	36,956	22
„ „ tertiana	31,916	5
„ „ quartana	1,282	2
„ remittens „	10,299	210
„ typhus „	557	118
„ „ icterodes	723	209

It may properly be asked, Is there any relation obvious etiologically between the peculiarities of climate and the diseases, the prevailing ones, especially fevers? The answer is not so satisfactory as we could desire. That there is some relation is certain, according generally with what is best known concerning the habitats of these maladies. By the tables, it appears that the first species, the common continued fever, is one of least speciality as to its place of occurrence, leading to the conclusion, pathogenically viewed, that it is referable to no special atmospheric condition, but to ordinary lædentia; and the large proportion of this fever at West Point amongst the military cadets, may be adduced in confirmation; as may also its tendency to terminate in health, as marked by its small fatality. The next species, those of the intermittent kind, are more limited; in a large number of instances they appear to be connected with the decomposition of vegetable matter and luxuriant vegetation, and to be arrested by whatever is inimical to either, whether cold or excessive dryness; yet there are exceptions; instances are recorded in this Report of the absence of intermittents where the conditions are such as would seem to warrant their appearance; and *vice versa*, of their appearance under circumstances it might be inferred most unfavourable to their production: and the same may be said of the allied species, remittents. We have marked several examples, but our restricted space will not permit our detailing them; nor indeed is it necessary, as they only agree with a previous conclusion of our own, founded on similar facts, as to the mysterious origin of malaria; and that though vegetable decomposition is a very frequent accompaniment of it, it is not the *sine quâ non*, the invariable accompaniment; and that the true nature of its cause, if it be a substantial emanation, is still an unsolved problem. For practical purposes, however, perhaps we cannot take a better criterion of the salubrity of a spot, when we have no positive experience of the influence of its atmosphere on man, than its vegetation, in union with temperature and the quality of water; a rich vegetation, a high temperature, and stagnant water, being mostly associated with malaria; and a low temperature—such as is incompatible with luxuriant vegetation, except of certain cryptogamia, and unfavourable to vegetable decomposition, rather favourable to the formation of peat—being even more invariably associated with the absence of malaria. More limited still in their occurrence, as displayed in the tables, are typhus and yellow fever. We can hardly err in assigning them special habitats; the former in wet and damp, and in damp and cold climates, provided the degree of cold is not below the freezing point, which is hardly compatible with dampness; the latter in a warm, or rather hot and moist climate, with a low state of electrical tension of atmosphere and a high dew-point—the necessary associates of a warm damp air. The etiology of the one seems less obscure than that of the other; typhus, in the majority of cases may be traced to idio-miasmata, the product of crowding, bad ventilation, bad drainage, neglect of cleanliness. In the Report under review, many examples are given of a striking and very instructive kind. The origin of yellow fever is more obscure, and the more so, because of its narrow limits and its irregular visitations, except in the southern cities of the Union, in which it appears to be (it is so stated) perennial. That it is owing, in part at least, to some exhalation from the earth, can, we think, hardly be doubted; and further, that the exhalation, whatever it may be, is not of the kind that is productive of intermittents and remittents, nor, though commonly most active when the temperature is high, and the dew-point high, not invariably or necessarily so. In the Report, a great deal of valuable information is to be found respecting this obscure and formidable disease, contributed by the medical officers of the United States army, very creditable to them; we allude, of course, to their clinical observations, apart from speculations; and these latter are not intemperately indulged in.

Relative to the other two great classes of diseases—those of the digestive and of the respiratory organs—we find, on consulting the tables, some facts brought out conspicuously, not without interest. Of the respiratory organs, we see how each varies from the other in frequency and fatality; the vast amount of cases of catarrh, including bronchitis, with the small proportion of deaths,—the majority of the former being cases of influenza, a prevailing ailment in the United States, especially on the Atlantic coast; the large number, also, of cases of pleurisy, with few resulting deaths; and comparatively the little prevalency of pneumonia, and its mildness; and what is not least worthy of note, the small number of cases of phthisis.

The following, taken from the Consolidated Abstract of the principal Diseases, is given in illustration:

	Cases treated.	Died.
Asthma	291	2
Bronchitis acuta	1,614	21
——— chronica	246	14
Catarrhus epidemicus	2,142	—
Catarrhus	30,969	9
Hæmoptysis	265	11
Laryngitis	184	6
Phthisis pulmonalis	442	257
Pleuritis	2,363	21
Pneumonia	1,416	127

In relation to diseases of the digestive organs, we observe a remarkable preponderance of diarrhœa (43,851 were the cases treated), and a large proportional mortality (385) from it, owing probably to its connexion with cholera; the proportional small fatality of dysentery (of 15,081 treated only 168 died), and even less so of hepatitis (of 263 treated only 7 died); the latter the more remarkable contrasted with its frequency and fatality in our Eastern Empire. The consideration of these peculiarities we must pass over, and in the one class as well as in the other, with the exception of a single disease belonging to the respiratory organs, and that on account of its almost world wide importance,—we allude to phthisis. Respecting this scourge much valuable information is contained in the Report, especially as regards the influence of climate, mainly tending to prove—and this we think is the fact of most importance—that a dry, cold atmosphere is least productive of the malady, and most conducive to its prevention, alleviation, and, if possible, cure. In the work a table is given, showing the amount of cases treated at the several localities or stations, with the deaths, which is not without its value. In estimating the prevalency of the disease, station by station, the compiler restricts himself, in forming a ratio, to the cases treated; these being considered by him, and we think justly, a better criterion than the mortality, a large proportion of the affected being invalided so soon as the disease becomes well marked. We do not think it necessary to enter into an analysis of the table, there are so many disturbing circumstances interfering with any great accuracy of inferential results. It may suffice to state, as regards the cases of phthisis treated, the ratio varies from 9·2 per 1000, the maximum, in the South Atlantic Region, to 1·3 per 1000, the minimum, in New Mexico; that is, with the exception of West Point, which is excluded from comparison, on account of its specialities, the force there being select cadets at the Military College, admitted only after strict examination as to constitutional health, and remaining there only for the limited period of four years. In the few remarks we shall offer we shall confine ourselves to that point which we think of most interest,—the influence of dry and cold air in connexion with tuberculosis. In corroboration of its beneficial effect, we shall give a few extracts from the Report. Assistant-Surgeon Wotherspoon, writing on the health-concerns of Fort Kent, in the North Interior Region, east of the Great Lakes, remarks:

> "The climate of Fort Kent, like that of the colder regions of Northern Europe, does not seem favourable to the production of pulmonary phthisis. During my sojourn at the post, I have neither seen nor heard of a case of this disease among the French or American settlers. Assistant-Surgeon Isaacs, who during the two years he was resident at the fort had a much better opportunity than myself of becoming acquainted with the diseases of the country, informs me, not only that he never saw a case of consumption in the country, but that some of the inmates of the garrison who were affected with suspicious symptoms, recovered from them entirely." (p. 27.)

Assistant-Surgeon Coolidge, reporting on the medical topography and diseases of Fort Fairfield, in the same region, remarks:

> "This post is uncommonly salubrious; the climate, though rigorous, is uniform for long periods, and does not appear favourable to the development of phthisis, or of other affections of the respiratory system. The country is very little settled, but so far as my observation extends, no case of consumption has occurred, either in the permanent inhabitants, or among the numerous parties of lumbermen who pass the entire winter in the open air, and are the most hardy and athletic of men. The diet of these men consists principally of

pork, bread, sugar, and tea, of which large quantities are drunk daily. Alcoholic stimulants are rarely, if ever, found in their camp, tea being the substitute. In the command two cases of phthisis have occurred: one, complicated with extensive pleurisy, with effusion on the right side, proved rapidly fatal; the other, though well marked—a large cavity having formed in the superior lobe of the right lung, attended with such extreme emaciation that at one time death was daily expected—recovered; a result which I attribute to the invigorating effects of this climate, and to the use of iodine internally. More than a year has elapsed since the subject of this disease returned to duty, during which time he has been fully exposed to the vicissitudes of the weather. He is now healthy and robust." (p. 29.)

Assistant-Surgeon Wood, writing from Fort Laramie, also in the same region, says:

"The climate of these broad and elevated table-lands, which skirt the base of the Rocky Mountains on the east, is especially beneficial to persons suffering from pulmonary disease, or with a scrofulous diathesis. This has been known to the French inhabitants of the Upper Mississippi and Missouri for many years; and it has been their custom, since the settlement of that portion of the country, to send the younger members of their families who showed any tendency to diseases of the lungs, to pass their youth among the trappers of the plains and mountains. The beneficial result of this course no doubt depends in a great measure upon the mode of life led by these persons—their regular habits, constant exercise in the open air, and the absence of the enervating influences incident to life in cities; but that more is due to the climate itself, is shown by the fact, that among the troops stationed in this region (whose habits are much the same everywhere), this class of disease is of very rare occurrence. The reports from the line of posts stretching from the Upper Platte, through New Mexico, to the Rio Grande, give a smaller proportion of cases of pulmonary disease than those from any other portion of the United States. The air in this region is almost devoid of moisture; there are no sudden changes of temperature; the depressing heats of the eastern summers are never felt; and although in the north the winters are extremely cold, a stimulant and tonic effect is the only result of exposure to the open air." (p. 81.)

Next to dryness of air, an equable temperature seems to be most beneficial to the consumptive. This is a commonly received opinion, and it is the opinion of the compiler; and as regards temperature, in conjunction with this quality, he prefers the low. If by low is assumed a very low temperature, such as insures a dry state of atmosphere, we are disposed to go along with him in his inference; but to reject it on any other ground, believing, as we do, that high atmospheric temperature with dryness is almost as little favourable to the production of tubercle, as a very low temperature with the same qualification as to dryness of air; and further believing, that even in warm and hot climates, with equability of temperature, although without marked dryness—such as those of Madeira, the south-east coast of Ceylon, the West India Islands, the coast of British Guiana—phthisis, as an indigenous disease, is rare, and is checked when imported, if not in a very advanced stage. Even in Malta and the Ionian Islands, neither very distinguished for equability, we have witnessed mitigation of symptoms and protraction of life in a remarkable manner in some instances of persons labouring under consumption, who were so circumstanced as to be able to command the comforts they required, and to be exposed as little as possible to atmospheric vicissitudes. It is hardly, we think, just, when considering the effect of climate, especially of a hot climate, on phthisis, to give much weight, as has hitherto been done, to the cases of soldiers, whether of our army or of the United States army, of whom, as regards health, so little care is taken, and who take so little care of themselves; and of whom also we may be certain a very considerable number labour under tubercles in the lungs at the time of their enlistment.

To the other diseases of the more conspicuous kind to which the troops of the United States are subject, we can afford but little space. We shall first notice briefly three, and those independent of climate; one, scorbutus, having its source in unwholesome diet; another, delirium tremens, in intemperance in drink; a third, venereal disease, in licentious morals. In the Consolidated Abstract of Diseases, no less than 2132 cases of scorbutus are returned, 40 of them fatal. The disease has occurred principally in the outlying stations, and amongst detachments employed on field service, at a distance from their regular quarters. Whether there has been any neglect in the rationing of the men, similar to that which was witnessed in the earlier period of the siege of Sebastopol, amongst our own troops, does not appear. The intelligence of the medical officers is shown in meeting the evil. Amongst the remedial means employed, two appear to have been specially serviceable, the wild onion and the expressed juice of the Agave Americana. The former was tried at Fort Arbuckle, in the South Interior Region, and is reported on very favourably by Assistant-Surgeon Glisan, who found it, he says, more efficacious than citric acid in arresting the disease. The latter was tried at several stations in Texas, and with the best effect. There is an interesting report on the subject by Assistant-Surgeon Perin, in which is described the method of obtaining the juice and of administering it. The fresh juice has been found more efficacious than the extract. As the plant grows wild in most of our West India Islands, it may be deserving of the attention of our army surgeons in that command, where occasionally cases of scorbutus and of purpura, a disease nearly allied to scurvy, occur, owing to the badness of the meat-ration and a deficiency of wholesome vegetables. It may be worth mentioning, that in instances in which scorbutic diarrhœa has appeared at stations where vegetables were scarce, the happiest results are reported to have followed the use of the supertartrate of potash in small doses long continued. There is a short paragraph which we must quote from the Report, for its value and for our regard to our own service:

> "The troops in various portions of New Mexico (says the compiler) have been afflicted with scurvy; the result of the usual causes of that disease—the use of salt meats and absence of all vegetables. *With the cultivation of company and post gardens, the disease has almost entirely disappeared.*" (p. 429.)

The italics are our own. Would that we could hear of such gardens being formed in our foreign garrisons and near our home barracks! The care and cultivation of them would be in every way beneficial, accustoming the men to the use of the spade; affording them healthy exercise and recreation, with a profitable return of an agreeable and wholesome addition to their too often ungrateful ration-meal. Were there such gardens established, we believe we should hear less during a period of peace of the tedium of a soldier's life in quarters, and of acts of suicide and desertion, very much the consequences of that tedium; and less, probably, even of drunkenness, the besetting vice of most armies, especially of our own and that of the United States.

Notwithstanding the efforts which are made to check this vice in the latter army, we find in the Consolidated Abstract 1699 cases returned of delirium tremens, and 3830 cases of ebrietas; the former productive of 98 deaths, the latter of 53, both together nearly double the number of deaths from all other diseases of the brain and nervous system, amounting to 88, of which 53 were from apoplexy—itself probably, in a large number of instances, connected with drunkenness. In several places in the Report, remarks are made by the medical officers on this vice of the men. Surgeon Moore, noticing the causes which operated to swell the mortality from yellow fever which broke out at Fort Brown, in Texas, in 1853, says:

> "The principal was intemperance; almost all the men indulged in drink to excess; some apparently driven to it by fear, but by far the greater number from the pure love of strong drink. Nothing could stay this drinking propensity; the men appeared determined to make true the saying, 'Let us eat and drink, for to-morrow we shall die.' I can certainly say I never saw so many drunkards congregated together before. It is remarked that the drunkard is almost sure to die; this saying was realized here, for nearly every intemperate man seized with the fever died." (p. 357.)

It is well remarked by another medical officer, commenting on the same vice:

> "In the army, indeed, we are presented with striking illustrations of a truth which should be engraved on the door of entrance to every hospital. The intemperate suffer most severely from diseases, and, as a general rule, fall its earliest victims." (p. 317.)

That venereal diseases should be common in this army is no more than might be expected, considering the class of men from which it is recruited, that no married men are eligible, and that the period of service is so limited, checking probably the desire to marry after entering it. Another conducing circumstance is the loose morals of the women of the Indian tribes, and the great prevalency of lues venerea and gonorrhœa amongst them. In the Consolidated Abstract, the large number of 12,121 cases appear under the head of diseases of the urinary and genital organs, the whole of which, with the exception of 229, are referable to venereal disease, with a resulting mortality of 21. Among the excepted cases are 33 of calculus, 72 of cystitis, 85 of enuresis (which perhaps should not be excepted), and 39 of diabetes.

We copy the following, in addition, from the Consolidated Abstract, for the reflection of the reader; for we cannot spare space to comment on them.

	Cases treated.	Died.
Punitio	218	
Pernio	812	3
Ictus solis	30	9
Morsus serpentis	65	2
Vulnus sclopeticum	1233	101
„ punctum	1081	20
„ contusum et laceratum	1605	6
„ incisum	6659	14

From the Consolidated Abstract it appears, that with an aggregate strength of 120,000 (that is, for the whole period under review), the total amount of cases is 352,685; the total amount of deaths 3617; the latter, exclusive of cholera, in the ratio of 2·58 per cent. of the strength; and this ratio the compiler thinks is even too high for the annual ratio, as an excess of deaths in 1849 is in part attributable to diseases contracted during the Mexican war. Such a degree of mortality as this, considering the wide range of climate, the nature of the service, and the description of troops, indicates, we think, favourably both as regards the general quality of the climate of these vast regions, and the care and the ability exercised by the medical officers in the performance of their duties.

In the Appendix, statistics are given of the war with Mexico; but as they are acknowledgedly incomplete, we shall not engage in their analysis. We shall restrict ourselves to the notice of one fact only, which the compiler thinks well established, and which is interesting, as showing the advantage of discipline even in relation to health; the fact alluded to is, that the loss by disease in the new levies and volunteers was considerably greater than in the old army; the more noteworthy, as the men of the latter, individually considered, were inferior in constitution. It would appear that the old army, whilst engaged, lost at the rate of 1·20 per cent. per month; the new regiments, ten in number, at the rate of 1·79 per cent.; and the volunteer force at the rate of 2·13 per cent. This last-mentioned force, during ten months' service, with an aggregate strength of 73,260, sustained a loss of 15,617 men and officers.

From the details we have given, some idea, but not an adequate one, may be formed of the value of this work. It contains a great amount and variety of information: the variety, in consequence of the instruction given by the Surgeon-General to the officers of his department; the amount, in consequence of the ability and zeal of these officers. The following is a copy of the Surgeon-General's circular letter on the subject.

"Surgeon-General's Office, April 30th, 1852.

"Sir,—It is contemplated to draw up a statistical report on the sickness and mortality in the army of the United States, in continuation of the publication issued from this office in 1840.

"You are therefore requested, in accordance with the requirements of paragraph 51, Medical Regulations, 1850, to prepare a paper on the medical topography of the post at which you are stationed. You will describe the geographical position of the post, the physical aspect of the surrounding country; the geological formations; its flora, its fauna (the animals, trees, and plants belonging to it); the characteristics of climate; the nature and causes of the diseases prevailing at the post and its vicinity, and how far these diseases can be traced to general or local causes, how far to habits and modes of life, to water, diet, &c. &c.

"In this connexion you are also requested to collect together as many facts as possible concerning the vital statistics of the inhabitants in the vicinity of your post, particularly of the Indian tribes; giving a brief but clear account of their several diseases, &c. &c., embracing every matter of information calculated to prove useful or interesting to the department and to the medical world.

"From the retained copies of the sick reports you will draw up the necessary tabular statements to elucidate the subject, and give the results in a condensed form. As it is proposed to publish each individual essay under the name of the gentleman who draws it up, all facts, statements, and conclusions will rest upon the responsibility of the officer making the report.

"Very respectfully, your obedient servant,
"TH. LAWSON, *Surgeon-General.*"

It is from materials furnished in compliance with these instructions, that this work has been formed; and the manner in which it has been executed by the officer to whom the task was assigned, Assistant-Surgeon Coolidge, is highly creditable to him. Hardly any topic to which attention has been drawn by the Surgeon-General has been neglected; and in the majority of them much interesting information has been brought together: we may mention specially the topographical notices, the meteorological observations, the geological and natural history sketches, particulars of the Indian tribes. These, of course, as given by different contributors qualified in different degrees, vary as to their value; but taking them as a whole, they may truly be considered as important accessions of knowledge. In no publication, perhaps, in so short a space, can a general acquaintance be made of so instructive a kind with the vast regions to which they refer. And besides the foregoing subjects, others more strictly medical are noteworthy—such as remarks bearing on sanitary arrangements, descriptions of barracks and hospitals,* the remedies employed in certain diseases—especially in cholera and yellow fever, on which there are special reports—and on the use of quinine. The extended and detailed reports on this invaluable agent are specially deserving of attention; they go far to prove that, given in large doses, it is efficacious in a heroical manner, not only in intermittents, but also in remittents, and is useful in a high degree in yellow fever; and that whenever there is a malaria-taint, it may be given with advantage and safety—as in typhus, and even in pneumonia and the other phlegmasiæ. It is instructive to observe how, since the bisulphate of quinine has been largely employed, disease has been checked and strength restored to certain stations previously crippled.

When we reflect on the value of this work, and how useful it is likely to be to the service, the impression being so large that every medical officer of the United States army can be supplied with one (1500 copies are reserved for this purpose), we cannot but regret that the medical statistics of our own army, occupying so many folio Blue-books, had not been drawn up in a similar manner, and by an officer of the medical departments rather than by a military officer, able in some respects as he has proved himself. We are confident such a work would have been more interesting and more useful; and we are as sure that it would have been creditable to the department—a department the officers of which have so few opportunities of distinguishing themselves, and whose exertions, however great, are so little brought under the eye of the public, and are, as a rule, so sparingly rewarded. Even now we are of opinion that it is not too late to follow the example before us. A compilation, in the way of selection from the materials already collected in the statistics edited by Colonel Tulloch, with additions from the ample documents lying neglected at the Medical Board Office in London, so compressed as not to exceed one volume, could hardly fail of being eminently useful; it might serve as a manual and guide to the young medical officer; be a record of scientific and professional ability, and an incentive to research.

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* Under this head we find two things which we consider deserving of notice and of adoption in our service—one, the paving of the ground floor with bricks steeped in tar, thereby preventing exhalation from the earth; the other, a layer of mortar, "a deafening," of about three inches in thickness, under the flooring of each story, and between the roof and the ceiling, thereby securing greater quietness, and promoting an equalization of temperature, coolness in summer, warmth in winter.

We have said, and we repeat it, that a work such as the one under consideration, is worthy of being consulted by army officers in command. This leads us to remark that in the Staff College now in process of organization at Sandhurst, judging from the curriculum of studies announced, we see no provision made to indoctrinate the student-officers in Hygiene. The work before us, and all experience in our own army, show how great is the ignorance of military officers on this most important subject, and what sacrifices of life have been made in consequence. Stations are selected, barracks and military hospitals are commonly constructed, without a medical officer being consulted respecting either; and the consequence is, that in too many instances the locality in relation to health has been ill chosen, and the plan of building, on the same score, sorely defective. It is a strong assertion to make, yet we can make it honestly, that after a pretty long experience and an extensive acquaintance with our hospitals and barracks at home and in our colonies, we cannot point out one of either kind not open to objection on sanitary considerations. The matter is one of national importance, and ought to have adequate attention, especially now that the value of the British soldier is becoming better known and appreciated, and his stalwart services more required and in increasing demand, especially in troubled India, where, for a long time to come, we fear, the grateful words, *cedant arma togæ*, will hardly be utterable, and even after the inhuman and unchristian *væ victis* shall have ceased to be the war-cry.

Having allowed so much space to the army medical statistics, we can afford but little, less than we could wish, to the larger subject, that comprised in the "Report on the Vital Statistics of the United States." It, too, is a work deserving of commendation, and will well repay the reading, rather we should say the careful study of it. It is a good example of logical and inductive reasoning from materials obtained from various sources, though, as regards the American ones, less complete and reliable on than could be desired. Nor is this surprising, when we consider that the collection of vital statistics upon a comprehensive scale is, as the author remarks, for the most part, new on that side of the Atlantic.

As we have seen that in the army of the United States and in our army there is much similarity of disease, and no very great difference of mortality, so, on consulting this work, we find a like similarity of results in the vital statistics of the two countries; tending to show that there is that belonging to man as a species, a *vis insita*, a power or influence, more operative and energetic than any external cause, whether in the form of diet or climate; the one, the former, maintaining the species; the other, the latter, having only a modifying effect.

Some of the more striking of these similarities, with occasional differences, we shall briefly notice, such as we consider clearly proved by Dr. Wynne from satisfactory evidence.

Commencing with birth, it would appear that in both countries there is an average preponderance of the male sex. Next, that there is a proportionally greater mortality of that sex before puberty and after the age of forty; and, in consequence of this greater mortality, an excess of the female sex—an excess most remarkable in the rural districts.

In both countries the chances of life in relation to age appear to be not very different, and to be similarly affected by extraneous circumstances, whether of place of residence in infancy, or of residence and occupation when arrived at maturity. The following table in its results, as regards occupations, tolerably accords with the English estimates. It applies to Massachusetts, and comprises a period of eleven years and eight months. The age given is that attained by the deceased in each of the selected occupations.

No.		Age.	No.		Age.
9698	Agriculturists	47·16	359	Masons	41·61
29	Artists	40·10	408	Mechanics	42·88
11	Bank officers	61·72	816	Merchants	52·06
688	Blacksmiths	51·41	69	Millers	61·58
124	Butchers	49·63	50	Musicians	40·46
198	Cabinet-makers	47·04	260	Operatives	34·19
1498	Carpenters	49·33	368	Painters	42·10
234	Clergymen	56·61	356	Paupers	65·19
347	Clerks	33·73	322	Physicians	55·25
286	Coopers	58·84	129	Printers	36·55
263	Gentlemen	63·83	80	Ropemakers	55·95
21	Glass-blowers	39·86	2289	Seamen	45·99
111	Hatters	54·90	238	Shipwrights	56·48
7	Judges and justices	67·19	2436	Shoemakers	43·66
92	Jewellers	42·56	194	Stonecutters	43·66
6410	Labourers	44·57	287	Tailors	42·51
171	Lawyers	56·60	175	Tanners and curriers	47·37
363	Machinists	37·63	648	Traders	46·53
313	Manufacturers	44·30	95	Weavers	46·83

"Of these 33,580 individuals, the combined ages amounted to 1,724,031 years, or 51·34 years to each man." (p. 208.)

The influence of climate in both countries varies with the seasons as marked by the mortality: whilst in England it is greater in winter and least in summer, in the United States generally it is greatest in summer and autumn, and least in winter and spring. This difference, we have little doubt, is connected with a greater prevalency of malaria in the new country than in the old; and the circumstance, that whilst the population of England is pretty equally divided between the towns and the rural districts, that of the United States is so distributed that only about one-fourth of the whole are collected in towns, and consequently the great majority are more exposed to the influence alluded to.

As might be expected, the diseases of the two countries exhibit some marked differences: those of the United States more resemble the diseases prevailing in England in the time of Sydenham than at the present time, more those of the camp than of the city. The following table is illustrative; it is extracted from the last census, and shows the total deaths in 1849–50, and the diseases productive of them arranged according to Dr. Farr's classification.

"From zymotic diseases the deaths were 131,813; of which died—

Of Cholera	31,506
Diarrhœa	10,706
Dysentery	20,556
Fever, general	13,108
„ scarlet	9,584
„ typhoid	13,099

The deaths from sporadic diseases and unknown were 192,210; of which died—

Of Dropsy	11,217
Cephalitis	6,424
Convulsions	6,072
Consumption	33,516
Pneumonia	12,130

What we find here may aid to account for the difference of seasons in their effects in the two countries just before alluded to. We see how dysentery and fever and consumption rank highest as to fatality, with the exception of cholera, of occasional occurrence. Now, dysentery, in the United States, is specially a disease of the hot months; and with the exception of typhus, the same remark is applicable to the fevers; they are most prevalent in the summer and autumnal months. Consumption, though more independent of seasons, yet is not altogether; from the tables given it would appear that the deaths from it are somewhat more numerous in the warmer than in the colder months—an accordance this with the previous remarks on the effect of cold when conjoined with a dry air in checking the progress of the disease, and even preventing its formation.

As to length of life in the people of the two countries, at present it seems difficult to arrive at any satisfactory conclusion, and this chiefly owing to the imperfect state of the data required for determining the averages in the United States. Where there is so great a variety of climate, so great a variety of condition of surface of country, also of the habits and occupations of the people, marked differences may be expected in the ratio of life in the several States. From the imperfect information hitherto obtained, it would appear that in the older and more northern States, the average length of life approaches nearer that of the parent country than in the southern and western. It appears also that the general average is on the increase—in itself an auspicious circumstance. The average of the productive class, that is, as has been defined, all between fifteen and sixty, as being "in full possession of their energies, and competent not only to produce a sufficiency for themselves, but likewise for those who are dependent on them," is also on the increase; this class, which in England is 56·70 per cent., in the United States, in 1830, was 51·01, in 1840 was 52·35 of the whole population.

We must now conclude. We have already commended the work for the logical precision and the inductive reasoning which it displays. It has other claims to commendation: its contents are rich in varied, and, we believe, as far as possible, exact information, tending to elucidate the many interesting problems in vital statistics, the solution of which is of the first importance in conducting fairly the business of insurance companies—the special object of the work—and is hardly of less moment as regards the history of man in his social state. We rejoice to see that the subject of vital statistics is beginning to have in the United States the attention it deserves. Let us hope that it will have the necessary attention of the central government, and that the great desideratum—that of a uniform system, on a liberal scale, and with a permanent staff for collecting the requisite data in their fullest amplitude—will not be much longer wanting.

REVIEW VI.

Guy's Hospital Reports. Edited by SAMUEL WILKS, M.D., and ALFRED POLAND. Third Series. Vol. III.—*London*, 1857. 8vo, pp. 513.

THE present volume of the 'Guy's Hospital Reports' contains twenty original communications, which are illustrated by nine lithographic plates, and numerous woodcuts. Many of these papers are of much interest and value. We would only observe, that some of them appear to us to be unnecessarily prolix; and that condensation of their contents would, in our opinion, have rendered them more readable and practically useful. We shall follow our usual plan of giving a brief analysis of the contents of the volume:

I. *Report of Seventy-two Cases of Tetanus occurring in Guy's Hospital since the year* 1825. By ALFRED POLAND.—This paper extends over eighty-eight pages. The author commences by giving a brief history of the whole seventy-two cases, which he then proceeds to analyse in a most elaborate manner, comparing his results with those of the Sir Jamsetjee Jejeebhoy Hospital at Bombay, as published by Mr. Peat and Dr. Morehead; with Dr. Laurie's 'Statistics of Tetanus in the Glasgow Infirmary;' the Reports of the Registrar-General, &c. The following are the chief results which he arrives at:—

1. *The frequency of the disease.*—During thirty-two years the cases of tetanus admitted into Guy's Hospital constituted only ·0063 of the total admissions; and of the total deaths, ·056 per cent. were from tetanus. In Bombay, on the other hand, during six years, tetanus constituted 0·8 per cent. of the total admissions, and 3·9 per cent. of the total deaths.

2. *Tetanus in the two sexes.*—Of the 72 cases, 12 were females and 60 males. This result corresponds with that arrived at by Dr. Laurie; but the difference between the two sexes is greater than appears from the Registrar-General's Returns. These make tetanus little more than twice as frequent in males as in females.

3. *Ages of tetanus cases.*—Of the Guy's cases, 48 out of 72 cases, or 66·6 per cent., occurred between ten and forty; and of the Bombay cases, 139 out of 166, or 83·7 per cent., between fifteen and forty-five.

4. *Constitution, diathesis, condition of body, habits, and previous health.*—Constitution and diathesis appear to exercise no influence either on the prevalence, duration, or mortality of the disease. On the other hand, of the robust and well-developed, there were 5 recoveries to 30 deaths; whereas, of the unhealthy, spare, and emaciated, there were 11 deaths and no recoveries. The temperate appeared to be equally liable to the disease as the dissipated and intemperate, but the data for this statement are very meagre. Out of 12 cases in which the previous diseases of the patients had been recorded, 2 had been the subjects of epilepsy; 3, of rheumatism; 2 were complicated with worms, &c.

5. *Season of the year, climate, &c.*—The prevalence and rate of mortality in the various months and seasons of the year are given with great minuteness; but on the whole, there appears to be little or no agreement between the returns of Guy's Hospital and those derived from other sources; so that the author concludes "that no great reliance can be placed on isolated returns." Of the whole 72 cases, however, he was "able to refer no less than 17 cases to exposure and change of temperature, either solely or associated with injury and disease;" and he quotes numerous instances from the records of military surgery, which "bear strongly in favour of atmospheric influence as the real point of causation."

6. *Form of the disease, &c.*—Three cases only, or 4·16 per cent., were idiopathic; in Glasgow, also, the number of idiopathic cases amounted to only 3·84 per cent.; but in Bombay to 38·46 per cent. With regard to traumatic tetanus, numerous details are given as to the situation of the disease, and its relative frequency in injuries and surgical diseases; and it is shown that "the severity of the symptoms bears no relation to the degree of local injury."

7. *The interval between the injury and the symptoms* varied in

the Guy's cases from one to twenty-eight days. In 49 per cent. of the cases, however, the symptoms supervened before the tenth day; and in 9½ per cent. only, were they protracted beyond the twenty-second day. When the disease showed itself close upon the injury, it was more uncontrollably rapid and fatal than when it commenced later.

8. *State of wound when tetanus set in.*—In 57 per cent. it was inflamed, suppurating, or gangrenous; and in 34 per cent. scabbed over, healed, or nearly so.

9. *Peculiarity of the symptoms.*—Among these peculiarities the most important is the following. There was a "remission of symptoms in 4 cases:" in 1, for two days; in 2, for thirteen days; and in 1, for many days.

10. *Duration of the disease in fatal cases.*—This varied from 4 or 5 hours up to 32 days. Of 62 fatal cases, however, 82 per cent. died before the tenth day. Out of the 72 cases 10 recovered.

11. *Post-mortem appearances.*—Of the 62 fatal cases, 44 bodies were examined, but only 34 inspections recorded. Of 20 cases in which the brain was examined, it was healthy in 11, and in the remainder the morbid appearances were but slight—such as congestion, an increase of the darkness of tint, &c. A similar remark applies to the appearances presented by the spinal cord. The nerves at the seat of the wound were inflamed in 5 out of 14 cases. Out of 16 cases, the heart was violently contracted in only 1; in 5 cases, both sides contained blood; and in 6 other cases, the right side was observed to be full of blood. Out of 7 cases, there was unusual post-mortem rigidity in 6; in 1 case this was observed five hours after death, and in another, fifty.

Lastly, we have some remarks on the treatment employed, into which our space will not allow us to enter.

II. *On Purpura, and its Connexion with Splenic Disease.* By S. O. HABERSHON, M.D.—This paper contains an account of 14 cases of purpura, which are prefaced by some general remarks on the varieties of the disease. Of the cases, 5 are classified under *Purpura hæmorrhagica;* and of these, 3 proved fatal. In all three, the spleen was found diseased. In 2 of the cases, the morbid condition is thus described:

> "The enlarged gland was of a dull red colour, and studded throughout with pale yellow spots, from one to three lines in diameter. They were connected with the capillary circulation, and consisted of cells, nuclei, and granules. It is doubtless correct to consider them Malpighian corpuscles; and as far as these observations point, they tend to show that this diseased condition of the spleen is a cause of purpura hæmorrhagica." (p. 91.)

In neither of these cases were the white corpuscles of the blood increased in quantity. In the other case the spleen was of normal size; "but the Malpighian bodies were large, pale, and appeared to form a considerable portion of the gland."

In connexion with these cases, it is interesting to observe that Dr.

Laycock, of Edinburgh, has recently advanced a theory, which ascribes the seat of acute purpura to the spleen, but to a different texture of the organ to what might be inferred from Dr. Habershon's observations. Acute purpura Dr. Laycock considers to be "in truth a diathetic disease, inasmuch as it occurs in persons of the rheumatic or gouty diathesis," and he believes "that the seat of the disease is in the fibrous coat and trabeculæ of the spleen."*

III. *Anatomical Description of a Double Fœtus.* By S. O. Habershon, M.D.—For the description and drawings illustrating the anatomy of this fœtus, we must refer to the original paper.

IV. *Select Surgical Cases.* By J. Cooper Foster.—Among these cases we find three in which tracheotomy was performed for the removal of foreign bodies from the air-passages. Two of the cases recovered, one died. Mr. Foster believes that great advantage is to be derived in such cases from "lifting up a piece of the trachea like a flap with a common tenaculum, and then allowing the foreign body to be expelled."

Three interesting cases are given, in which fatal hæmorrhage resulted from division of each of the following large veins; the internal jugular, popliteal, and cephalic.

The paper concludes with an account of five cases of extravasation of urine in children, resulting from ulceration of the mucous membrane of the urethra by the impaction of a calculus. None of the patients were more than five years old. The author calls attention to the frequency of this accident in children, and asserts that all cases of extravasation of urine occurring in children, independently of accident, result from this cause. He gives the following practical directions to be followed in such cases:

"1. Attend to the earliest symptom—viz., retention of urine in children.
"2. Incise the parts freely into which the urine has extravasated.
"3. Search for and remove the calculus immediately.
"4. Do not pass a catheter." (p. 142.)

V. *Remarks upon some of the Specimens of Diseases of the Bone contained in Guy's Museum, especially those styled Osteo-Sarcoma and Myeloid, with reference to the question of Malignancy.* By Samuel Wilks, M.D.—Dr. Wilks first makes some excellent observations on the proper meaning to be attached to the terms "cancerous" and "malignant." Although it has been advanced by Drs. Walshe and Hughes Bennett, that it would be a great gain to science to relinquish the term "malignant" altogether, we quite agree with Dr. Wilks, that "the question as to the malignancy of a new growth is the most important which can be asked concerning it." A patient requires the surgeon to inform him, not whether the tumour in his body is composed of fibres, fat, or cancer cells, but what are the dangers with which it threatens his system: in other words, what is the degree of its malignancy.* Dr. Wilks truly observes that the microscope has shown "that cancer and malignant disease are not universally interchangeable terms;" and "that various growths which exhibit the utmost degree of malignancy are not cancerous." With equal truth he adds, that in considering different tumours, the term "malignancy is only a question of degree." Dr. Wilks even goes further: he entirely repudiates the idea of a "specific morbid element" in cancer, and thinks that the microscope has shown "that there is no more distinct line to be drawn between cancerous and non-cancerous growths, than between malignant and non-malignant disease," the structure of a cancerous tumour being influenced by that of the tissue in which it is developed, the constitutional diathesis being in all cases the same. We cannot help thinking that there is a little inconsistency between these remarks, and the assertion that cancer and malignant disease are not interchangeable terms. If we deny the existence of a specific structure to cancer, the terms cancerous and malignant, in our opinion, become synonymous.

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* Edinburgh Medical Journal, Aug. 1857, p. 129.

Dr. Wilks describes numerous preparations of "osteo-sarcoma" and carcinoma of bone contained in the Guy's Museum. With regard to these tumours he observes:

> "In the so-called *osteo-sarcoma*, the growth appears wholly to proceed from the periosteum, until a large tumour is formed around the bone, so that in all cases the shaft is still seen running through the tumour, and is thus distinguishable from the perfect cancer." (p. 150.)

And again, he says, in some of these osteo-sarcomatous tumours—

> "The growth from the periosteum is undoubtedly carcinomatous, but has bony spiculæ developed in it, and is only one degree less malignant than that first-mentioned of true cancer, where the soft medullary matter is so much in excess, that the healthy bone becomes wholly destroyed." (p. 159.)

There can be no doubt of the fact, that cancer originating from the periosteum is attended with an increase of bony matter, whereas cancer commencing in the interior of a bone (excepting those cases of so-called "osteoid cancer" of which Dr. Wilks gives an interesting example), produces expansion and atrophy of the bone. We question, however, if these results are to be attributed to a difference in the inherent malignancy of the cancerous matter in the two cases, so much as to the difference in its relative situation.

Dr. Wilks also gives a description of twelve undoubted examples of myeloid tumour in Guy's Museum, and shows that the cases of *spina ventosa* of the old surgeons were examples of this disease. Ten out of the twelve cases were situated in the neighbourhood of the knee-joint. There was nothing to indicate any malignancy in any of the cases; but the statement, that all observers have hitherto agreed that they are non-malignant, is scarcely correct.†

VI. *On the Treatment of Purulent Ophthalmia.* By JOHN F.

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* See some remarks on this subject in the Edinburgh Medical Journal for June, 1857, p. 1093.

† See British and Foreign Medico-Chirurgical Review, April, 1857, p. 338.

FRANCE.—This paper contains an account of 10 cases of purulent ophthalmia. The treatment advocated seems precisely similar to that described in a paper by Mr. France in the first volume of the present series of the 'Guy's Hospital Reports,' of which an abstract appeared in the 'British and Foreign Medico-Chirurgical Review' for April, 1856. (p. 309.)

VII. *Ophthalmic Cases.* By JOHN F. FRANCE.—These are four in number. The first is a case of melanotic cancer of the eye, in a woman between forty and fifty years of age. The globe was excised; but the disease returned in other parts of the body, and the patient died seven months after the operation. Two cases follow, of tumour of the globe, in which Bonnet's operation of enucleation from the ocular capsule was had recourse to with success. The last was a case of fungoid disease of the globe, in a child aged two and a-half years, which terminated fatally.

VIII. *Cases of Idiopathic Fatty Degeneration, with Remarks on Arcus Senilis.* By SAMUEL WILKS, M.D.—Dr. Wilks applies the term "Idiopathic fatty degeneration" to those cases which, during life, are distinguished by excessive anæmia and debility, and in which a fatty degeneration of all parts of the body, but especially of the heart, is the most remarkable appearance found after death; excluding such cases of fatty degeneration as are dependent on old age or on intemperance. He records nine such cases in his paper. In some of the cases he was inclined to think that hæmorrhages, diarrhœa, or miasmatic influences might have produced such a debility of the system as to result in this general change of all the tissues; but in others, no such explanation would apply. All the patients were comparatively young, and one was only sixteen. In none of these cases was there any arcus senilis.

The paper concludes with some observations on the connexion which has been supposed to subsist between arcus senilis and fatty heart. Although the author believes, with Mr. Canton, that arcus senilis consists in a fatty degeneration of the cornea, he does not consider that it is indicative of any peculiar changes within the body, but rather that it is a concomitant of senile changes (which may be premature) in the body generally.

> "Our principal reasons for attaching no greater importance to it are these:—That in cases like those above related, where some cause is in operation to produce a fatty degeneration of the heart and other organs, independent of that which exists in the after period of life, no such changes in the cornea are found. Also, that in most cases where a fatty heart is the accompaniment of valvular disease in young persons, it is absent. Again, its occasional absence in old people who have fatty hearts, and its very frequent presence in old people where various senile changes are found, but which are not of a marked fatty kind." (pp. 213-14.)

Twenty-three cases have been collected from the hospital-books of "Fatty heart with no arcus senilis, or but slightly present," including

7, in which the fatty change was connected with disease of the valves; and also 15 cases of arcus senilis with no fatty degeneration of the heart. In only 1 case was an arcus found associated with a fatty degeneration of the heart in a young person.

Again, Dr. Wilks observes:

> "Where the arcus does exist with fatty heart in old people, the change is not so much that of the muscle itself, as of the external fat increasing at the expense of the wall of the right ventricle." (p. 217.)

This condition of the heart is not uncommon in old people. Dr. Wilks gives 7 examples of it; and seems to think that Mr. Canton must have confounded this with true fatty degeneration of the muscular fibres.

IX. *On the Causes of Death after Lithotomy.* By THOMAS BRYANT.—The material for this paper has been derived from 176 cases of lithotomy collected from the clinical records of the hospital, and from the post-mortem examinations of 40 fatal cases.

The principal results arrived at are as follows:

1. That 14·20 per cent. of the cases operated upon prove fatal.

2. That 30 per cent. of the fatal cases are during the first twenty years of life; 10 per cent. during the second twenty; and 60 per cent. above forty.

3. That lithotomy is twice as fatal during the first five years of life, as it is during the second; but that between eleven and twenty years of age it is more fatal than during any earlier period.

This relatively great mortality from the operation in young people is certainly at variance with what has commonly been observed. Sir Astley Cooper remarked, that "the age at which there is least danger is from three to twenty, for death is then a very rare occurrence."

4. The following were the causes of death in the 40 fatal cases:—

	Cases.		Per cent.
Hæmorrhage	6	...	15·
Shock of operation	5	...	12·5
Pyelitis, inflammation of kidneys	6	...	15·
Pelvic cellulitis	6	...	15·
Pyelitis and pelvic cellulitis	6	...	15·
Pelvic cellulitis, with accidental causes, such as hæmorrhage, and puncture of rectum	3	...	7.5
Pyæmia	5	...	12·5
Acute cystitis	1	...	2·5
Peritonitis	1	...	2·5
Inflammation of air-passages after chloroform	1	...	2·5

As regards chloroform in lithotomy, Mr. Bryant concludes that, independent of its own special risks, it does not seem to have any influence upon the fatality of the operation.

X. *Cases of Retention of the Menses relieved by Puncture through the Rectum.* By HENRY OLDHAM, M.D.—Two cases are recorded, the first being the result of congenital absence of the vagina; the second, of closure of the vagina after labour, by adhesion of its walls and cicatrisation. In both cases the operation was successful; and in the former, the patient continued to menstruate regularly *per rectum.* In some general remarks, the author advocates this operation in preference to the formation of an artificial vagina.

XI. *Cases of Disease of the Pulmonary Artery and its Valves.* By G. Whitley, M.D. — The paper contains the records of 5 interesting cases, in which the morbid conditions found were as follows :—

1. Dilatation of the artery, with thickening, irregularity, and puckering of valves.
2. Large vegetations on the margin of each valve.
3. Entire obliteration of the valves.
4. Almost entire obliteration from recent rapid inflammation.
5. Obstruction of the pulmonary orifice by vegetations, so that it would only admit a probe.

In the two first cases, disease of the pulmonary valves was diagnosed during life ; the most marked signs in both cases being *frémissement cataire,* and a blowing murmur heard over the base of the heart, loudest towards the *left* margin of the sternum, at a point corresponding to the third left costal cartilage ; double in the first case, systolic in the second. In the third case "a double bruit was always audible at the base of the heart ;" in the fourth, "heart's sounds said to be normal ;" and in the fifth there was a "bruit with both sounds at the base of the heart."

XII. *Abscess of the Brain.* By William Gull, M.D.—The author repudiates Lebert's notion as to the possibility of *idiopathic* cerebral abscess. All abscesses of the brain he thinks may be referred to one or other of the following causes :—

1. Direct injury.
2. Suppuration of scrofulous deposit.
3. A secondary result of some chronic disease of the head, as of the nose or internal ear.
4. A secondary result of the suppurative process in some distant part of the body—"Metastatic abscesses."

It is in cases belonging to the last class, he observes, that the cause is most apt to be overlooked. Among the 16 cases recorded in the paper, are several interesting examples of cerebral abscess preceded by suppuration in the liver, spleen, kidneys, mesenteric glands, lungs, rectus abdominis muscle, &c.

One remarkable case is mentioned, showing with what rapidity a cerebral abscess may become surrounded by a strong cyst. A boy died eleven weeks after receiving a blow on the head ; near to the seat of injury an abscess was found surrounded by a cyst, this cyst being one-eighth of an inch thick, composed of fibro-cellular tissue, and of considerable firmness.

"The pathological order of the symptoms in abscess," as described by Dr. Gull, "is headache, local or general convulsion, drowsiness, paralysis, coma. The headache is rarely paroxysmal and neuralgic, as it is in tumour, but more general and uniform in its expression, as well as more sudden in its rise, and acute in its progress."

Secondary abscesses of the brain, however, are often remarkably *latent* in their progress.

XIII. *Paraplegia from Obstruction of the Abdominal Aorta.* By William Gull, M.D.—The subject of this interesting case was a shipwright, aged thirty-four, accustomed to lift heavy weights. In March, 1855, while stooping at his work, he was suddenly seized with pain in the loins, followed by complete paraplegia, including paralysis of the sphincters. No pulsation could be felt in the abdominal aorta, nor in the arteries of the lower extremities; but a blowing murmur was audible down the back, and over the lower end of the sternum. After a time he gradually recovered from the paralytic symptoms, and the superficial arteries of the abdomen and back became greatly enlarged. As this arterial anastomosis became more distinct he regained more power, and in August, 1857, he was able to walk and do light work. There never was any symptom of venous obstruction, nor of absorption of the vertebræ.

XIV. *Contributions to the Practical Surgery of New Growths or Tumours. Series I. Cancer.* By John Birkett.—This paper is composed of the histories of 14 cases, illustrating the different varieties of Surgical Cancer. Addressed, as these "Contributions" are, especially to students, we think the author would do well to be a little more exact in his nomenclature than to employ such an expression as a "tubercle of cancer." The term "tubercle" is restricted in pathology to a morbid structure totally distinct from cancer, and such an unnecessary association of terms can only tend to perplex the uninitiated mind.

Among the most remarkable cases are two of "melanic cancer;" two of "melanoid cancer," distinguished from the former by the black hue being due to infiltration of blood, and not dependent on the development of brown pigment granules in the interior of the nucleated cells; and one of "osteoid cancer" of the fore-arm. One of the cases of "melanic cancer" is particularly interesting, from the fact that although the melanotic deposits were found generally distributed throughout the body, the lungs and liver were exempt. Mr. Pemberton, of Birmingham, has recently shown that these are the very organs which are most frequently affected with secondary melanotic cancer.*

XV. *Remarks on the Wax Models in Guy's Museum, representing Roseola Cholerica and Roseola Variolosa.* By the Curator.—These models have been executed by the distinguished artist, Mr. Towne, and constitute a valuable addition to the unique collection of models of skin diseases in Guy's Museum. The first series referred to illustrates the *Roseola Cholerica*, "a term applied to a rash which has been observed to accompany the secondary fever of a certain number of cases of cholera in all the epidemics which have hitherto occurred in

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* See British and Foreign Medico-Chirurgical Review, Oct. 1857, p. 418.

Europe." In the autumn of 1854, it was observed in 4 out of 111 cases admitted into Guy's Hospital. It appeared from the sixth to the tenth day after the first seizure, as an exanthem all over the body, but especially on the extremities. It is described as consisting sometimes of "raised, bright pink patches;" at other times "of a uniform mottling all over the surface, resembling measles or scarlatina."

By *roseola variolosa* is not meant here the roseolous rash which often precedes the eruption of small-pox, but one which is thought occasionally to take the place of the true pustular eruption in persons who have been exposed to the contagion of small-pox, and in whom the most violent constitutional symptoms of the disease are present, but who have either been vaccinated, or had small-pox previously.

XVI. *Description of a Case in which a Urethro-vesical Calculus was Removed.* By ALFRED POLAND.—This calculus consisted of two principal portions; one lodged in the membranous portion of the urethra, and another in the bladder; the two being connected by a narrow neck. The author has also collected from various sources the descriptions and figures of six other similar "dumb-bell" calculi.

XVII. *Note on Cases of Black Urinary Precipitate.* By H. M. HUGHES, M.D.—In the last volume of the 'Guy's Hospital Reports,'* Dr. Hughes gave an account of some cases in which the urine had been passed of a brownish-black colour by persons taking creasote. The present case is of a different nature: the urine appears to have been passed clear, and the black deposit resulting from the addition of nitric acid appears to have been quite independent of any medicine which the patient was taking. "Upon boiling the urine no coagulation occurred; but upon the addition of nitric acid, a dense, black, opaque precipitate occurred."

The patient was a man, aged fifty, under treatment for an abdominal tumour, situated below the region of the liver. Dr. Hughes had never observed this remarkable phenomenon, except in one other case; and was unable to decide upon what it depended.

Such cases are probably not so rare as Dr. Hughes would seem to believe. Several cases have lately been observed at King's College Hospital, in which a copious black deposit has been thrown down from the urine, on the addition of any mineral acid. The nature and cause of the deposit are as yet obscure; but the subject is one which merits investigation.

XVIII. *Sequel of a Case of Successful Trephining of the Skull for Rupture of the Meningeal Artery, performed fifteen years ago.* By EDWARD COCK.—This man, who in 1841, at the time of the operation, was forty-six years of age, was able to resume his work, and continued in full employment, and, with the exception of some epileptic fits, in excellent health, for thirteen years. About August 1854, one of his fits was followed by partial hemiplegia, on the opposite side to the injury. On August 30th, 1856, he had an apoplectic fit, and shortly after died. On examination of the body, the dura mater was found firmly incorporated with the portion of scalp closing up the orifice in the bone. There was a large extravasated clot in the corresponding hemisphere, surrounded by softened cerebral substance, which was thought to be dependent on extreme disease of the bloodvessels throughout the brain.

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* See British and Foreign Medico-Chirurgical Review, July, 1857, p. 184.

XIX. *On Poisoning by Tartarized Antimony, with Medico-legal Observations on the Cases of Ann Palmer, and others.* By ALFRED S. TAYLOR, M.D., F.R.S.—This, and the following paper, are by far the most important in the whole volume; and, as contributions to medical jurisprudence, must be regarded as of very great value. Our space will not allow us to do more than point out some of the more prominent points in each; but we would advise every one interested in the subject of toxicology, to make himself master of their details.

Dr. Taylor commences his paper on antimony by repudiating the idea, which at the time of Palmer's trial many endeavoured to inculcate, that tartarized antimony is not a poison, and could not destroy life so long as a medicinal dose was not exceeded; and he observes that these statements have received a practical refutation from the recent trial and conviction of two individuals, for murder by this means—Macmullen and Hardman. He then goes on to examine some of the medical questions connected with antimonial poisoning, on which a great discrepancy of opinion appears to exist among members of the profession; and to illustrate the present state of medico-legal knowledge, by reference to several cases which have come before our legal tribunals.

He considers the subject under the following heads:

1. History and nature of tartarized antimony.

2. Action of tartarized antimony in small doses as a medicine and as a poison, or chronic poisoning.—The practice of Rasori, Tomasini, and Laennec of prescribing antimony in repeated large doses in certain forms of inflammatory disease, has been thought to furnish a proof, that antimony is not a poison; and that if large doses can be borne by patients in certain states of disease, similar, or even larger, doses may be borne with impunity by persons in a state of health. Dr. Taylor seems to doubt, if, in some of these cases, the patients have not been actually poisoned by the antimony; but at all events he argues, and justly so, that this very diseased state of the system may generate a *tolerance* of the medicine, greater than in health. He also shows from the experiments of Dr. Mayerhofer, of Munich, Dr. Wetzler, of Augsburg, and Dr. Jankowich, of Ofen, upon their own persons, that the action of antimony on the *healthy* human organism is far more powerful than it is commonly supposed to be. In order to judge whether antimony has been administered with a good or evil intention, one must ascertain whether it has been persisted in or withdrawn,

after its dangerous effects have been clearly manifested by the symptoms. In conclusion, Dr. Taylor observes:

> "The result of this investigation is, that there appear to be certain diseased states of the body which modify or suspend that excessive action of tartarized antimony on the system, to which the term 'poisoning' is applied: that great precautions are required in its use, even in these cases, or it may destroy life; that large and repeated doses have been frequently taken by patients without causing symptoms of poisoning, and with actual benefit; but there are no facts to justify the inference that this substance is not a poison to the healthy, or to those persons who labour under any disease in which tolerance is not speedily established. The healthy and the diseased will die alike from its effects, if the symptoms indicative of poisoning, (vomiting, purging, pain, and depression) are once established, and not afterwards suspended, either by the withdrawal, or in certain cases by the continued administration of the medicine." (p. 401.)

3. Action of tartarized antimony in large doses as a poison—acute poisoning.—Dr. Taylor has arranged in tabular form 37 cases of this nature. Of these, 21 recovered, and 16 died. The symptoms in such cases are minutely described; and it is shown from the observations of Magendie, that vomiting may occasionally be absent. In most of the cases, the symptoms showed themselves within half an hour of the administration of the drug. As regards the *fatal dose*, he says we must look rather to the *effects* than to the *actual quantity* swallowed, the effects of the same dose varying greatly with age, constitution, &c.

4. Symptoms of acute poisoning by tartarized antimony compared with those of chronic poisoning.

5. Appearances after death in antimonial poisoning.

6. Chemical processes for the detection of antimony in the body in a free and in an absorbed state.—Amongst other modes, Dr. Odling's modification of Reinsch's test is described, and commended.*

7. The absorption, deposition, and elimination of antimony.—Antimony appears to be rapidly absorbed into the system, and eliminated chiefly by the urine, whether it be given in a large dose, or in repeated small doses. Hence it is important to examine the urine in cases of suspected antimonial poisoning. After death, there may be no antimony in the stomach, and yet it may be found abundantly in the liver, spleen, and kidneys; and Orfila's experiments render it improbable, that it would remain longer than fifteen days after its last administration in any of the organs important to life.

8. Cases of imputed poisoning by tartarized antimony.—In this inquiry, Dr. Taylor shows that the reputation of a medical practitioner may be seriously involved; but he observes, that it is only where injury has resulted from gross carelessness or unskilfulness that a medical man can be held responsible.

9. Cases illustrative of the criminal administration of antimony.—Under this head we have a lengthened medical history of the case of Ann Palmer, a perusal of which, we think, must convince the most sceptical that the deceased died from the effects of repeated small

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* British and Foreign Medico-Chirurgical Review, July, 1857, p. 138.

doses of antimony administered to her by her husband. A short notice is appended, of four other cases of criminal poisoning by antimony, including that of John Parsons Cook.

XX. *On the Detection of Absorbed Strychnia and other Poisons.* By Alfred S. Taylor, M.D., F.R.S.—The object of this communication is to bring forward additional facts to aid in the solution of certain questions propounded by the author in a paper in the last volume of the 'Guy's Hospital Reports.'*

1. Can strychnia be infallibly detected in the tissues of the body as a result of its absorption and deposition in all cases in which it has destroyed life? A remarkable instance is adduced to prove the contrary. In February, 1857, a gentleman died in the Isle of Wight, with all the symptoms of strychnia poisoning, six hours after swallowing three grains of that drug. Portions of his viscera were examined by Professor Christison and Dr. Douglas Maclagan of Edinburgh, by Professor Geoghegan of Dublin, and by Dr. Taylor himself. Not one of these eminent chemists could detect in them a vestige of strychnia; although the same process of testing was employed as that by which Dr. Letheby asserted he could detect in the putrid body of an animal poisoned with half a grain, within a small fraction of the dose given! Some experiments also are alluded to by Dr. de Vry of Rotterdam, from which it appears to be highly probable that that part of the strychnia which acts mortally is *decomposed* in the living body, and that if a larger quantity has not been administered than is just necessary to cause death, the cause of death *cannot be proved* by a chemical examination of the intestines.

2. Can a person die from poison, and no poison, either free or absorbed, be found in the body? Two cases within the last year show that such may be the case. The first was the case of the Rev. Dr. Alexander, who died in sixteen days, from the effects of arsenic which had been accidentally mixed with arrow-root, of which he partook. The symptoms were unmistakeably those of arsenical poisoning, yet Professor Geoghegan was unable to discover a trace of arsenic in the viscera after death. The second was a case in which even Mr. Herapath believed that a child had been poisoned by phosphorus, although he could not find any trace of this substance in the body.

3. Can we place confidence in the employment of colour-tests for the detection of alkaloids in a dead body, in the absence of any corroborative evidence? Dr. Taylor most truly observes, that if a man is to be condemned to death on *chemical* evidence, that evidence should be conclusive and satisfactory to every reasonable mind; otherwise innocent persons might be brought to the scaffold, and all confidence in chemical evidence would be destroyed. He does not think that colour-tests alone are to be depended on for the detection of the poisonous alkaloids, and brings forward an instance in which Dr. Letheby fell into a grievous error by too implicit a reliance upon them. Of a patient who died suddenly of disease of the heart, after

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* See British and Foreign Medico-Chirurgical Review, July, 1857, p. 139.

taking a pill and two doses of a mixture, Dr. Letheby, from placing too implicit a reliance upon colour-tests, declared that he had detected in the stomach "about one-tenth of a grain" of morphia; yet after examining the medicines, which contained no opium in any form, he allowed that he must have mistaken taraxacum for morphia!

Review VII.

1. *The Enlarged Prostate, its Pathology and Treatment; with Observations on the Relation of this Complaint to Stone in the Bladder.* By Henry Thompson, F.R.C.S., M.B. Lond., Assist.-Surgeon to University College Hospital; Consulting Surgeon to the St. Marylebone Infirmary, &c.—*London*, 1858. 8vo, pp. 320. With Five Plates.
2. *The Prostate Gland, and its Enlargement in Old Age.* By Decimus Hodgson, M.D. Edin., M.R.C.S. Eng., Demonstrator of Anatomy in the University of Glasgow.—*London*, 1856. 8vo, pp. 84. With Twelve Plates.

So many reasons concur to recommend the study of the diseases of the genito-urinary organs, that the interest of novelty could hardly be expected to attach to any fresh researches and publications upon them. Yet neither scientific zeal nor any other motive has caused previous investigators to exhaust the subject, and we have before us a couple of works, making up together some 400 pages, on the prostate, and, according to the title pages, on the enlarged prostate, in one of which at least there is something both valuable and new.

Nearly the first half of the work of Dr. Decimus Hodgson is occupied with the descriptive anatomy and the physiology of the organ. It is in every way worthy of a teacher of these subjects in the Glasgow University, and of the gold medal awarded to its author on his graduation by the University of Edinburgh; but the publication of it, in addition to the sufficiently exact descriptions of the parts which we already possess, appears to us superfluous. The latter half of the book contains an excellent account of the present state of our knowledge on the hypertrophy of the prostate. Mr. Thompson reproduces the results of his numerous dissections of the organ, nearly as they are to be found in the last volume of the 'Medico-Chirurgical Transactions,' and he discusses every disease which could be brought under the general title, the enlarged prostate. Both works are illustrated with excellent plates.

Since the publication of the researches of Dr. C. Handfield Jones, Professor Kölliker, and Mr. Adams, the prostate has been regarded less as a secreting, than as a muscular organ. For although it possesses numerous ducts, the orifices of which are visible in the urethra, on either side of the veru montanum, yet upon microscopic examination, and even with careful dissection, it can be ascertained that the follicles, out of which the ducts issue, are embedded in organic muscular fibres. Professor Ellis has extended our knowledge even further, and has shown that the vesical portion of the organ is not glandular at all, but is entirely composed of a circular muscle, embracing the inner orifice of the urethra. He thus separates the prostate into two parts, the lobes and anterior extremity of which contain in its muscular bed all of the organ that is glandular, whilst its vesical portion is a sphincter of the bladder analogous to the circular thickening of the muscular tunic, which in the female, without a prostate, encircles the corresponding orifice between the bladder and urethra.

Both Dr. Hodgson and Mr. Thompson concur with former writers in regarding the prostate as an appurtenance of the sexual organs. That question is settled by John Hunter's observation of its greater size during the procreative period in some animals, whose sexual functions are only occasionally active. But the part taken by the prostate in generation is as obscure now as before these two volumes were issued. That it augments the bulk of the seminal fluid is plain; and it is probable that its acidity conduces in some way to the vigour or the fluidity of the alkaline secretion of the testis. We have known so much since Mr. Adams wrote on the prostate five years ago.

The pathology of the organ goes far to complete the proof which physiology has already furnished, that the prostate is the male analogue of the female uterus. Placed, like the uterus, at the confluence of the seminal ducts, the prostate might be expected not only to enclose the utricle, but also to bear traces of a similar structure to that of the womb. The discovery of a large proportion of the organic muscular fibre mixed with its scanty urethral glands, supplies as close a proof of primordial identity as could exist in two organs, whose functions in adult life are fundamentally distinct. The similarity of these diseases, first sketched by M. Velpeau, may best be given in the words of Mr. Thompson.

> "The two organs thus similarly constructed, are very frequently the subjects of tumours, identical both in external and histological characters. Thus, in the uterus we find these formations nearly or completely isolated, made up of organic muscular fibres, with connective tissue imbedded in the substance of the organ, or standing out in relief from either surface. In the prostate we meet with precisely the same tumours, and they are similarly disposed. . . . .
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> "In the uterus we are familiar with another form of tumour, which, springing from the interior, and forming a polypoid growth there, is much more intimately connected with the uterine structure than the variety just described, perfect continuity of tissue existing between it and the polypus. So from the posterior median portion of the prostate we meet with an outgrowth tending in form to become truly polypoid, which continues its development in the direction of least resistance, and exhibiting complete continuity of structure with the prostate itself. It contains also the glandular elements proper of the organ in varying proportions. . . . . .
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> "The two organs are subject to considerable hypertrophic enlargement, mainly consisting of their constituent fibrous elements. And in both, this condition may be associated with some tumour-formation, or it may exist independently of it. In the latter case, the hypertrophy may be general or local, affecting the whole or certain parts of the organ; and when thus local, affecting particular spots more commonly than others. All these remarks apply equally to the prostate and to the uterus.
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> "The two organs are liable to these changes after the prime of life has

passed. Bayle, whose observation is quoted by Rokitansky, and verified by Dr. Robert Lee, says that twenty per cent. of women after thirty-five years of age, have fibrous tumours of some size in the uterus. I have found prostatic tumours in thirty per cent. of males after fifty." (pp. 42-4.)

Grouped together in Mr. Thompson's work, under the head Enlargement of the Prostate, are diseases so various, that the book and its title are incongruous in a scientific point of view. It is, in fact, a treatise on the whole pathology and surgery of the organ. Enlargement is an almost universal character of the diseases of the prostate, as the subjoined list of them will show:

I. Inflammation and Abscess. II. Tubercle. III. Cysts. IV. Cancer. V. Hypertrophy. VI. Enclosed Glandular Tumours. VII. Glandular Outgrowths. VIII. Polypous Growths from the Veru-Montanum.

We shall find no space for a full notice of each of these subjects, and as the chief facts stated respecting most of them are not new, we shall devote attention chiefly to the latter half of our list.

I. *Inflammation* of the prostate, in the acute form, appears chiefly noticeable for the distinctness of the signs which characterize it, for its proneness to suppuration, and for the permanent enlargement of the organ which the inflammatory effusions entail. Probably these effusions constitute the only origin of an uniform enlargement of the prostate, every increase of its size from other causes being attended with irregularity of shape. Prostatitis, apart from those cases in which the gland inflames in resentment of direct injury, or through its continuity with adjoining structures, which are in the same state, —pure, unconnected prostatitis is "extremely rare:" it would perhaps be more correct to say that its cause is not always discovered. The usual outlet for the matter, when suppuration has occurred, is by the urethra; but the possibility of its also escaping by the rectum, or even, as has been known to happen, into the peritoneum, renders it important in some cases to evacuate the matter by a surgical operation. In selecting a situation for making the requisite opening, Mr. Thompson gives preference to the middle of the perineum. He thus amplifies Sir Benjamin Brodie's simple directions to puncture the abscess in that situation:

> "The fore finger of the left hand having been introduced into the bowel, a long, straight, and narrow bistoury, the cutting edge of which is upwards, should be thrust into the raphé, about three quarters of an inch anterior to the anus, in the known direction of the swelling, and the incision enlarged in a straight line upwards, to a slight extent, so as to give a fair patulous opening for the discharge of matter. The depth to which such an incision must be carried cannot be less than an inch and a half, it may be two inches." (p. 206.)

Chronic prostatitis, and its connexion with spermatorrhœa, have been more fully worked out by Mr. Adams than has been done in the books before us.

II., III. *Tubercle*, *Cysts*, and *Hydatids* of the prostate are diseases too rare to allow of our doing more at present than to refer to their occurrence.

IV. *Cancer.*—Considering the very great frequency of this disease in the uterus and mamma of the female, it is an instructive fact to observe that cancer very rarely occurs in the prostate and breast, the corresponding organs in the male subject; and further, that, as compared with the uterus, prostate, and female breast, the male mamma, which is without function, is the least frequent seat of malignant disease. Lebert, indeed, does not recognise the fact of cancer ever primarily affecting the prostate; but accumulated testimony leaves no doubt on our minds that it is not unfrequently to be found in that organ. Mr. Thompson tabulates twenty-four cases of primary malignant disease of the prostate, one-fourth of which were found in children of five years of age and under, and the remaining three-fourths after forty. All but one of the twenty-four were cancers of the medullary kind. The recognition of these distressing cases is sufficiently plain when the ordinary signs of urethral obstruction increase with unusual rapidity, and are associated with a large tumour pressing on the rectum, with cancerous infiltration of the inguinal glands, and sometimes, though not always, with urethral hæmorrhage, and with pain. The cancerous cachexy confirms a diagnosis already by no means difficult. In one particular Mr. Thompson's opinion appears to us at variance with his facts—viz., in the possibility of obtaining visible evidence of the disease within, by the microscopic examination of what escapes from it. Mr. Simon alleges that, in a case of his,

> "'The nature of the tumour had been fully recognised during life by the presence in the urine of granules and flocculi of animal matter, which under the microscope showed the large coherent nucleated cells of encephaloid cancer.'" (p. 226.)

A somewhat similar statement is made by the same writer, in his account of a second case; and the fact was noticed also in an instance of the same disease observed by Mr. Moore, and reported in the 'Medico-Chirurgical Transactions,' vol. xxxv. We cannot, therefore, see reason for the doubts expressed on the subject by Mr. Thompson. In the early stages of the growth there may be no escape of its cancerous elements; but we are of opinion, and Mr. Thompson partly expresses the same view, that the urine should be microscopically examined in every stage of a prostatic disease which may be of cancerous nature.

V., VI., VII., VIII.—It is in the chapters on the hypertrophy, tumours, and outgrowths of the prostate, that Mr. Thompson's work is of most value. His position at the St. Marylebone Infirmary gave him the opportunity of making numerous examinations of the prostate in old men; and the results of these examinations are here recorded. As our readers will perceive, this author has materially advanced our knowledge of the structure of the enlarged prostate of advanced age.

One important fact ascertained by these examinations is, that enlargement of the prostate is not only not the rule in old age but decidedly the exception. If we take the ordinary weight of a healthy prostate to be about 4½ drachms (and in this estimate the researches of Dr. Hodgson and Mr. Thompson concur), it will be seen that in specimens taken indiscriminately from men of fifty years old and upwards, a proportion of about 13 will correspond, without much deviation, to the normal form and weight, 1 will be abnormally small, and 7 deformed and enlarged. It is further interesting to observe that the period of life between fifty-five and sixty-five is that during which the affection is most commonly developed, and that it appears rarely to commence after seventy years of age, and never before fifty.

There is but little ground for objecting to the use of the term "glandular," as applied to the enlarged portions of the prostate of old persons. Whether the enlargement take place toward the bladder in the situation of the "middle lobe" of Sir Everard Home, whether it protrude as an outgrowth from one of the lateral lobes, or more uniformly occupy the entire organ, the microscopical and general characters of the new substance differ in no material particular from the adjacent normal structure. The middle lobe has its visible ducts, which open by distinct mouths at a convenient part of the urethra, and "the microscopical elements which constitute the structure of enlarged prostate are identical with those which compose the organ in the healthy state." The added portions are of muscular texture intermixed with glands, and vary from the healthy tissues only in the relative proportion of the two materials. We shall not follow Mr. Thompson in his classification of different cases of enlargement, according as they contain more or less of the one or other structure; the fact which he has ascertained is of pathological interest, but leads to no practical issue. Whether the muscular or the glandular compound predominate, the new growth equally resists efforts to procure its absorption.

Upon the anatomical characters of the enlarged prostate Mr. Hodgson's descriptions are so entirely his own that he must speak for himself:—

> "The presence of tumours imbedded in the prostate of advanced age has been already referred to. It is much more common than is, I suspect, generally believed. Sir E. Home observed them, and suggested that they were probably apoplectic clots, marking the occurrence of internal hæmorrhages, to which he believed the organ extremely liable. Their presence may be noted in not less than 7 specimens out of 10, engraved in the second volume of his work on the prostate, by inspection of the illustrative engravings only. Cruveilhier describes them, from his own dissection, minutely, and regards them as distinct glandular formations, surrounded by muscular tissue like that of the gravid uterus. After an examination of a very large number of morbid preparations, I have come to the conclusion that enlargement is not merely very frequently associated with the development, more or less marked, of such growths in some one of the forms described, but that the production of defined tumour or outgrowth is, much more frequently than otherwise, the essential element of the pathological condition generally known as hypertrophy of the prostate." (p. 34.)
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> "We have already seen that an independent and limited portion of the prostate may exhibit undue development, while surrounding parts are either but slightly or not at all affected by any such action. The outgrowth from the posterior median portion is the most familiarly known example of this.

It is then generally composed for the most part of the ordinary structures of the prostate, although sometimes containing a smaller proportion of the secreting elements than a portion of the organ in the normal state, and it appears to enjoy activity of function in common with the rest of the prostate. It assumes a pyriform shape even in its earliest stage, and is always continuous in structure with the adjacent prostatic tissues from which it springs. Often single, there are sometimes two or even three such outgrowths, apparently simultaneously developed from this part. One usually predominates, and ultimately entirely or partially obscures the other." (p. 38.)

"Hypertrophy by outgrowth, although most common in the part described, is not invariably confined to it. A projecting growth may occasionally spring from the posterior part of either lateral lobe, and has been even observed to arise from that part of the prostate which lies above or anterior to the vesical orifice of the urethra.

"It must not be overlooked that general hypertrophy of the tissues of the prostate may, and commonly does, co-exist with tumour or outgrowth—almost invariably with the latter. And doubtless the outgrowth is only a more marked expression of the same disposition which pervades the whole organ, but not improbably determined by the form and nature of the cavity towards which the protrusion is directed; the existence of the cavity of the bladder probably permitting a development which would not be possible in other directions, where masses of solid structure oppose such extension. With circumscribed tumour, also, there is often general hypertrophy, but not invariably. A prostate of average weight may be full of these bodies of very small size, but which from some unknown circumstances had not come to be further developed. It follows that in such a case atrophy of the prostatic tissue proper must have occurred." (pp. 39-40.)

"There is one form of tumour, or rather of outgrowth from the prostate, the occurrence of which is extremely rare. It has no relation to any of the preceding varieties. It is a polypus springing from the veru-montanum. I know of three instances only. One, which occurred in my own practice, was about five-eighths of an inch in length, soft in consistence, and at its base was continuous with the apex of the veru-montanum, lying in the urethra, which it appeared to fill, and reaching to the neck of the bladder. It was composed of the elements of fibro-cellular tissue, with a few organic muscular fibres intermingling at its base. In some parts were seen near the centre of the growth some minute crystal-like bodies, having very much the appearance of uric acid, yellowish in tint, and rhomboidal in form, with a few octahedra. They proved to be crystals of some earthy carbonate. The tumour was covered with mucous membrane, and columnar and spheroidal epithelium.

The only point in the history of the patient which related to the presence of the polypus was, that he had for some time been in the habit of passing water with greater frequency than usual." (pp. 45-6.)

Since tumours of the kinds thus described may grow in any position, and protrude in any direction, the consequences of their presence may be found in any of the organs adjoining the prostate. Both authors enter at length into a description of the effects of enlargement of the prostate upon the urethra and its vesical orifice, and upon the bladder, as well as into the remoter consequences which may affect the rectum, ureters, and kidneys. Omitting the latter portion of these results, and the connexion between a hypertrophied prostate and vesical hernia, we may content ourselves with some notice of the more common effects of the disease.

The prostatic portion of the urethra may be diverted from its course, and altered in its dimensions and shape according to the accidental situation of the tumours which encroach upon it. Its length is always increased, and sometimes is nearly doubled. In one direction, likewise, its diameter may be greater than natural; but the increase is due to the expansion of the canal over a prominent tumour, and is not attended by an augmentation of the capacity of the urethra, but rather by a diminution of it, since the pressure of the tumour against the canal in one direction more than does away with any advantage which might arise from its expansion in another direction. For the most part these tumours are placed on the side of the urethra, which is then narrowed laterally. When such a tumour exists on one side only, the urethra necessarily deviates towards the opposite side. If, however, a tumour should exist in each lateral lobe, and the two should not be directly opposed to one another, two lateral curvatures of the urethra result, and a consequent difficulty in guiding a catheter into the bladder. In such cases a catheter devised by Mr. Wormald, having its curved portion laterally flattened, is of great value. We have been able to introduce such an instrument into the bladder when the ordinary round prostatic catheter could not be made to pass. We have been surprised to find no reference to this ingenious suggestion in either of the works under review.

The effect of an enlarged prostate upon the neck of the bladder varies little, whatever be the shape of the enlargement. In nearly all cases the orifice is raised and carried forward. The posterior median portion or middle lobe being the most usual seat of the disease, its presence necessarily alters the shape of the vesical orifice, and it affects the function of micturition more seriously in proportion as it encroaches forward upon the urethra. Whether, however, the tumour occupy the middle or lateral portions of the organ, its effect upon micturition is without question almost only obstruction. In some instances the vesico-urethral orifice appears opened out, and larger than natural. They are cases in which more than one tumour protrudes into the bladder on opposite sides of the urethra, the real situation of the orifice becomes indistinct, and the space between the tumours is counted for the neck of the bladder. No difference, however, is observed in the effect upon the flow of urine. Obstruction and its consequences ensue; and occasionally a portion of mucous membrane, raised between the tumours, acts like a valve in increasing the difficulty of micturition. It is very questionable whether any other result than obstruction—whether, in fact, a true incontinence of urine, ever occurs as a consequence of enlargement of the prostate. Neither Dr. Hodgson nor Mr. Thompson has met with an instance of organic inability of the bladder to retain urine in a case of enlarged prostate; and the latter author only admits the possibility of such a circumstance on the authority of Mercier. In his 'Recherches sur les Maladies des Organes Urinaires,' M. Mercier gives the particulars of four cases which had been under his own care, in each of which the bladder was found empty and contracted in size, while the prostate was considerably but equally enlarged, and the internal meatus patent and triangular. During the latter part of life, incontinence had been present in each case, and there had been no retention of urine.

In the large majority of cases, however, the sequence of events is very different. The flow of urine is obstructed at the neck of the bladder, and the hypertrophy which takes place in its muscular coat, though combined with frequent efforts of micturition, fails to evacuate the bladder. A residue of urine cannot be got rid of, and it augments as the obstruction continues, until the bladder becomes permanently dilated. Paralysis of the muscular wall, and the well-known overflow of surplus urine—overflow, not incontinence—then take place, and give warning of the final damage which may be expected to ensue in the form of cystitis, calculus, and destructive inflammation of the kidneys.

It would be impossible to introduce into our narrow limits anything like a full notice of the various questions of treatment which arise in the course of this disease. Most of them are amply discussed in Sir Benjamin Brodie's work on the urinary organs. We can but briefly allude to a few of them.

As to treatment directed against the growth itself, we find Dr. Hodgson quoting with approval Mr. Stafford's employment of iodine, both internally and as a local application; and the use of the hydrochlorate of ammonia in large doses by the Germans. Mr. Thompson, on the other hand, disapproves of the introduction of iodine into the urethra, but still rests his hope of benefiting enlarged prostates, upon that remedy, and upon bromine. His mode of employing them is described at p. 151. It consists in administering the iodide or bromide of potassium internally, daily tepid hip-baths of water from the Elizabeth-Quelle of Kreuznach, and the following enema, which must be introduced with an india-rubber bottle and ivory tube :—

℞. Potass. iodidi, gr. v.
Kreuznacher bittern, ʒij.
Dec. hordei vel lini, ℥iij.
Misce pro enema, quotidie uteudum. (*sic.*)

To this a little opium may be added if necessary, in order to enable the bowel to retain it; or a suppository of the iodide and bromide of potassium may be substituted for the injection.* Now considering that the enlarged structure bears much the same relation to the healthy prostate, that a chronic mammary tumour does to healthy breast-tissue, or a fibrous tumour to the uterus in which it is embedded, the probability of advantage is readily estimated. We turn to Mr. Thompson's chapter On the Causes of Enlarged Prostate, and find him attributing the disease to a "contingency of structure," which seems to us not far from asserting that these tumours grow because they grow. Our ignorance of the real cause of the affection forces us to the conclusion that any treatment hitherto suggested is likely to do no more than retard the progress of enlargement. Mr. Thompson

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[* Dr. Prieger, of Kreuznach, has assured us that he has known enlargement of the prostate reduced by the employment of the Kreuznach waters and bittern.—Ed.]

expresses the same opinion respecting his own, as well as other plans of treatment.

An ingenious instrument is figured at page 159, by which Mr. Thompson aims at dilating the prostatic portion of the urethra, on the plan employed by Dr. James Arnott in the treatment of strictures; and it appears likely to be so far useful as to restore that part of the canal to some of its original fitness for ready and complete micturition.

> "It consists of an ordinary metallic catheter, which may be of any form or size required, with a stop-cock at the handle, and a syringe containing air or water, which fits accurately to the mouth of the catheter. A tube of prepared india-rubber, measuring about five or six inches in length, is closely drawn over the entire instrument, and fastened by a thread of silk close to the handle. On applying the syringe, previously filled with water, and making pressure, the fluid passes through the eyes of the catheter, the lower three inches of the india-rubber tube become very gradually distended equally in every direction, until the diameter reaches to the half or three-quarters of an inch, or even to almost double this extent, if required."

We are no advocates for rough treatment of prostate glands—such as that of some French surgeons, who draw a short-beaked sound out of the bladder with its point turned towards the rectum,—but it seems to us that such an instrument as this soft and equable dilator might, with caution, be made to remain a considerable time in the urethra, and to effect a proportionate amount of permanent enlargement of the narrowed canal.

The local remedies of cystitis appear to us to be written of with less approbation than is due to them. The application of tepid water, or of a weak solution of nitric acid, directly to the bladder for a few minutes once a day, is not enough to counteract the bad effects of the contact of acrid urine with the mucous membrane for the remainder of the twenty-four hours. The injected fluids may be of the mildest kind, or diluted to any degree, but they should be renewed by means of a syphon-apparatus and double catheter, and employed for two or three hours at a time. We have injected in this manner continuous streams of much diluted laudanum, gallic acid, nitric acid, chlorate of potash, and nitrate of silver, and have had reason to be much satisfied with the abatement of the symptoms and the comfort of the patients. Attention should at the same time be given to restoring its natural acid reaction to the urine; and when the mineral acids fail to effect this object, it must be remembered that possibly the urine may be acid at its first secretion, and may acquire its alkaline reaction in the bladder. In such cases, proceeding on Dr. G. O. Rees' theory, and Sir Gilbert Blane's practice, we may need to correct the presumed acidity of the renal secretion, and, though the urine when voided be alkaline, may administer alkaline medicines. Those salts should be employed in which the alkali is combined with a vegetable acid, especially the citrate of potash, and the tartrate of potash and soda. By this means alone the reaction of alkaline urine is not unfrequently changed, and becomes acid. Upon this subject we append an interesting observation by Mr. Thompson on the use of benzoic acid.

A man, aged sixty-eight, having cystitis with prostatic obstruction, and passing ammoniacal urine, mucus, pus, and a little blood, improved upon taking twenty minims of the dilute hydrochloric acid every two hours, so that the urine even became faintly acid. Upon omitting the remedy, however, the alkalinity of the urine immediately returned. The bicarbonate of potash was then administered, without any advantage resulting; but from the time of his taking "Acidi benzoici ℈j, sp. vini rect. ℥iss; ex aquâ, quaque 6tis horis (*sic*)," all the symptoms decreased, and eventually he "was discharged without any bad symptom." The catheter was employed till nearly the end of his attendance, when it was no longer required.

REVIEW VIII.

1. *De la Prostitution dans la Ville de Paris.* Par A. J. B. PARENT-DUCHATELET. Troisième Édition. 2 Tomes. Vol. I., pp. 732, Vol. II., pp. 892.—*Paris*, 1857.
2. *Prostitution, considered in its Moral, Social, and Sanitary Aspects in London and other large Cities, &c. &c.; with Proposals for the Mitigation and Prevention of its attendant Evils.* By W. ACTON, M.R.C.S.; formerly Externe of the Female Venereal Hospital in Paris; late Surgeon to the Islington Dispensary; Fellow of the Royal Medical Society, &c.—*London*, 1857. pp. 189.

WHOEVER will be at the pains of investigating the history of prostitution in all its different relations, will infallibly arrive at this conclusion, that of the many evils which afflict humanity, there is not one more pregnant with miseries, moral and physical. The depravity of mind spread by this vice throughout the world is very great. Its detestable nature is patent to all. With an unblushing front, in the open face of day it parades its characteristics to the world. Man it brutalizes; and woman—whose features artists and poets in their sublime creations have chosen to represent the nearest image of Divine love on earth—with its seal of degradation upon her forehead, becomes the mark of universal scorn.

But injuries to the moral life of humanity are not the only ills which flow from prostitution. Wherever it walks it scatters around it a pestilence of physical evils—diseases which pervade and corrode the body to its core. In what dark outhouse of human suffering, then, can philanthropy find a fitter field for its exertions, or hope to reap a richer harvest of good deeds, than in this, where the minds and bodies of mankind lie bound in disease and sin, where there is in truth—

"Ample room and verge enough
The characters of hell to trace"?

Yet have men—and good-hearted men, too—hesitated to touch, and rather shunned the subject. Outraged morality and religion, like conscientious Levites, have turned away their face, and passed by on the other side, leaving the wounded victims of prostitution weltering in the pains and penalties of their ill doings; they have restrained by their pious arguments the warm-hearted impulses of those who would have been otherwise well inclined to act the good Samaritan's part. This, our high-toned preachers have told us, is a foul thing, and will pollute the hands of him who touches it; the miseries which prostitution spreads abroad among the sons and daughters of men are the legitimate results of the unholy traffic; the avenging finger of an offended Deity is plainly visible in them; to interfere between the evil and its consequences is to come between Eternal Justice and those who have outraged her laws; these sorrows must run their undisturbed course; and through them must man find his way back into the paths of honesty and virtue.

Such is the harsh verdict which a rigid morality has passed upon the sufferers from prostitution, and which has too long received the silent approbation of society. But this may no longer be. Civilization, enlightened by Christian love, is marching ever onwards. Man's conscience is awakened, and an inward voice urges him to look into the dark byways of humanity. And, truth to say, the voice of human sympathies has never been wholly hushed even here. There have been pious souls and kindly hearts, from time to time, who were not ashamed to pour a ray of light into the darkness. These little solaces, indeed, were but small pearls dropped into the ocean of suffering vice; they availed nothing in diminishing the wide stream of vice itself. Still, they were witnesses of man's abiding love.

The false reasonings of righteous severity are now passing away before the light of scientific research. Ignorance of his true obligations, and of the nature of the physical and moral miseries engendered by the vice, might have once been an excuse for man's inaction; but it can be pleaded as such no more. A busy world of philanthropists are everywhere hopefully employed in attacking the ills which torment society, in baring their causes to view, and in attempting to apply the appropriate remedies. It is impossible, therefore, that so flagrant a corruption as prostitution can longer be permitted to run its course unquestioned. The fictitious veil of decency which has been vainly hung around this painful scene of life, must be torn aside. False modesty has now become a sin as well as a folly. The magnitude of the vice forces itself even upon the most unwilling eye; at every turn in the paths where men congregate it displays its ill proportions. They who would attempt to ignore its existence, display the cunning wisdom of the ostrich, which, as the fable tells, will thrust its head into the sand when it can no longer escape the huntsman, and so nurse itself into a belief that it is hidden from the eye of the pursuer:

> "Stultorum incurata pudor malus ulcera celat."

But let those who would evade the subject reflect for a moment on the nature of the woes which result from prostitution. The physical evils, the diseases engendered by the act, are of no passing kind. Syphilis, left to itself, will work its way into the bones and marrow of a man; and when fairly lodged in the body, is apt to remain a tenant for life. Through its effects the hale and vigorous man may become a burden to himself and to the society in which he lives, and his injured constitution repeated in a sickly and degenerate offspring. The sins of the parent are visited upon the children; the unborn child is poisoned in its mother's womb, and draws poison from its nurse's breast. Many a mother—equally of the high as of the low of the land—watches over a sickly progeny, little dreaming of the polluted source from whence her children have derived their weakly frames. Such is the nature of the disease. Its prevalence among the different classes of society may be inferred from the fact that nearly one-half of the surgical out-door patients of our metropolitan hospitals seek relief there for venereal diseases, of which numbers about one-half are women and children. One hospital alone, St. Bartholomew's, registered nearly 15,000 such cases on its books during one year.

But what pen can relate the moral sufferings attendant upon the vice? Who shall ever sound the depth of that abiding tale of woe, abandoned profligacy, wild excitement, despair, and misery, which is the history of the prostitute's life—of that region of sorrow, where "peace and rest can never dwell"? Who can realize its amount? Ten thousand women tread the streets of London, noted down by the police as common prostitutes; and yet these represent but a small proportion—some say but a tithe—of those to whom the title justly appertains. The extreme youth, the mere childhood of many of them painfully strikes the observant eye. What brought them to this pass? Let it never be forgotten, that many a one of them is driven to the practice from sheer want—to supply herself or her children with bread; that large numbers are reared and bred up to this life of infamy from their very childhood, entering it, not from any innate propensity for sinning, but led by the force of circumstances which surrounded them. There are in certain parts of this metropolis numerous habitations wherein both sexes indiscriminately herd together like mere animals. Here all sense of decency and virtue is lost, and the most degrading passions of our nature have full play; and prostitution becomes the business of the girl, as thieving does of the boy. Is theirs the fault?

We have surely said enough to show what a vast field of sin and sorrow awaits the hand of true benevolence here. And we ask our professional brethren to enter with us for a while into the subject, and calmly to consider whether their influence on society may not be so exercised as in some degree to assuage these many miseries. Who, indeed, so well fitted as the physician to take the good work in hand? Our profession—always forward in the pursuit of better things for suffering man—has headed many a noble mission; it has ever marched in the van of civilization. Into this dark corner of life, also, it has been the first to enter boldly, the first to throw a ray of hope where neither light nor hope had ever entered before. There indeed it finds a fitting place as leader and director. The diseases—the physical evils—which are associated with prostitution come altogether under the consideration of the physician; who, then, so able as he to take cognizance of the moral evils likewise? We are not blind to the difficulty of the task proposed. We cannot do all we would, but we think we can convince our brethren that very much may be done—that every one of us may do something—towards diminishing prostitution. We know well enough the folly of attempting the impossible, and the ridicule to which even good men who attempt it expose themselves, and the injury which their failure inflicts on the cause they would promote. We therefore ask our professional brethren to strive for that only which is directly practical in this business. When men cannot do the good they would, they must be contented to do the good they can. The evil may be too deeply seated to admit of extirpation; the cancerous disease may have taken too firm hold of the constitution; but still the physician has a duty to perform. He does not abandon his wretched patient; he lessens the anguish, he diminishes the attendant suffering, and, as far as may be, controls the spread of the disease. This is his daily work while busied with the sufferings of the body. Why should he be less energetic or less logical in dealing with this both moral and physical disorder of the world?

Some quarter of a century has passed away since M. Parent-Duchatelet astonished the world by the revelations which his painful researches enabled him to make concerning the history of modern prostitution. His labours were of great service in calling the attention of serious men to the subject at the time; and they have been effective also in keeping it alive in the minds of the public up to the present moment. Thoughtful articles, telling of this matter, have since then appeared from time to time in some of our leading Reviews. We ourselves have had occasion to call the reader's attention to it. But still, as we have hinted above, the hearts of the people or their ears have never been gained or touched so as to obtain for this subject a due and fitting consideration.

Recently, Mr. Acton has published a special work upon prostitution, containing much information which we believe and hope will have the effect of bringing the matter more prominently home to the thoughts of our profession and the public. A third edition of M. Parent-Duchatelet's work has also just appeared: it is edited by the heads of the police and the Board of Health of Paris, and contains a large amount of new and very instructive matter. Several other works also lately published have assisted in attracting attention to this subject.

These efforts indicate that a time has arrived when we may reasonably hope that an attempt may be successfully made to stem this torrent of corruption which is polluting the social atmosphere around us. We therefore sincerely wish that Mr. Acton's book may obtain an extensive notoriety, and we congratulate him upon the moral courage which he has shown in so boldly facing the prejudices of the world. His book contains, in epitome, the facts which have been collected by different writers on the subject, and also some results of his own observations. He is especially indebted to the last edition of Duchatelet's work for the account he gives of prostitution in Continental cities.

The most interesting part of Mr. Acton's book is that wherein he details his schemes for the cure, or alleviation and prevention, of prostitution. Herein we think that he is partially successful. We cannot, it is true, see our way to the practical carrying out of his sanitary measures for the treatment of venereal diseases; but we think his proposals for the prevention of prostitution very good. He deals with this part of the subject in a comprehensive spirit which cannot fail to recommend his opinions to the consideration of all persons who calmly reflect upon them. With a true professional spirit, he searches out the causes of the malady, and from a due appreciation of them, derives the indications for its cure. Experience has taught us, indeed, the utter futility of all temporizing and half measures in the face of the great ills of humanity. What miserable littleness it is, for instance, to erect fever hospitals, while we permit the seeds of fever to lie scattered broadcast among the population; of how little avail to whitewash the sepulchre, while the elements of destruction—inviting their fitting guest, the King of Terrors, to enter—are left rankling within. It has also taught us here, that to diminish or remove the evils of prostitution, we must destroy the causes which provoke it. In what way can houses of refuge for the female victims of prostitution, for example, serve to lessen the sum of prostitution, so long as the causes which provoke the vice be in full action? We may thereby, it is true, snatch one brand from the fire, but it is only at the cost of another, who will be inevitably drawn into the furnace to fill up the void. The philanthropist must dive down deep into the story of prostitution; there only will he find a guide to direct his benevolent footsteps aright.

The matter, then, in Mr. Acton's book is useful; and it is given, moreover, in a manner which cannot fail to recommend it, and we fear too warmly, to the general reader. Parts of it are written in a style which, except for the many blemishes disfiguring them, might be called eloquent. Some of the sketches, indeed, are forcibly drawn, and when perusing them we only regretted the more to find them so rudely marred by ill-timed jokes and unpleasantly expressed sentiments. The style of some works is a matter of minor importance; but not so of one of this nature. Every word here should be carefully weighed, and every sentence written in a solemn mood. "Ridentem dicere verum," is absolutely forbidden on such a topic. Terms like the following—"painful *liaisons*," "flaunting a *liaison*," "gentlemen being cleaned out," "old *dames de maison*, extinct planets of the Georgian era," "half-fledged nurselings," and numerous such phrases, are met with throughout the work, and cannot fail to diminish its worth, by introducing into the mind of the reader a feeling of levity at a most inopportune moment. They may make the style more racy, and with certain persons will render the matter more attractive, but they in proportion destroy the force and real value of the sentiments contained in it. We trust Mr. Acton in a future edition will purge his volume of these defects, and relieve it from the loose and slangish dress in which it is now clothed. Good sentiments require well-fitting habiliments.

We shall now proceed, with the object above referred to, to place before our readers a short history of prostitution, as it lies detailed before us in the works of M. Duchatelet and Mr. Acton, pointing out its extent, explaining its causes, and suggesting the remedies which, if honestly applied, cannot fail to lessen its attendant miseries. Let us first of all endeavour to gain some idea of the magnitude of the evil. By so doing we may be enabled to judge of the awful amount of suffering which is necessarily engendered by it.

Whoever will give himself the trouble to examine the statistical returns and the different data upon which the calculations as to the number of prostitutes existing at one time in any town are founded, will find that they are of a most unsatisfactory nature—that, in fact, nothing can be derived from them even approximative to the actual truth. This alone appears certain—viz., that the number is fearfully great. Some charitable statisticians magnify the figures in such case, in order to excite the sympathies of the public in behalf of the institutions they are pleading for; and then, on the other hand, the police returns necessarily, and for obvious reasons, fall far short of the real number.

The fact is, that in all large cities the police are able to note down pretty accurately the number of regular street-walkers—the known prostitutes—whose sole business and trade is the sale of their persons; but it is utterly impossible for them to calculate with any degree of accuracy the number of females who live a life of clandestine debauchery (as M. Duchatelet terms this phase of prostitution)—those, for instance, who are engaged during the day in some ordinary business, and who are, as it were, only casually engaged at other times in the traffic of prostitution. The police returns, which may be trusted, fix the number of known prostitutes in London at about 10,000; but we have nothing satisfactory to guide us in calculating the amount of those engaged in clandestine prostitution; and writers have necessarily, therefore, drawn upon their imaginations when they have made such a calculation. Some have reckoned that the two classes of prostitutes together reach the number of 100,000, some say 80,000, and others are contented with putting it at 50,000, and less.

It is worth remarking here that one writer copies another on this matter, so that the original error (if such it be) is repeated again and again, and so at last is apt to be received by the incautious reader as something like a positive truth. Foreign writers, again, have, out of patriotic motives, assisted in spreading the report of the magnitude of the evil in London; but assertions from such quarters should always be taken with much suspicion of their correctness. Frenchmen, with rare exceptions, neither read nor speak the English language; nor have they the will or the ability to comprehend the genius, the manners, and the habits of Englishmen, or the free play of the institutions of this country. They invariably view such things from their own Parisian mode of seeing, and consequently, as a rule, see them distorted. Thus they have been very eloquent—among them M. Léon Faucher—in declaiming upon the rampant state of prostitution, as publicly exhibited in the streets of this metropolis, and against the wicked carelessness of a Government which permits such a state of infamy to exist. They see in the mad debauchery flaunting in our streets manifest signs of the "*décadence de l'Angleterre*;" they declare prophetically that the virtue, the honour, and the bodily vigour of the people is sapped to the core, and gradually passing away; and then turn with pride to the superiority of their own better way of managing these things.

We refer to this point, because we find that English writers copy and endorse these Parisian misstatements. Heaven knows, we have no word of palliation to offer in extenuation of the great amount of the vice existing amongst us; but the real and undoubted sum of it is so exceedingly great, that there can be no occasion unduly to magnify it. We may add here, that we have carefully examined the different statistics on this head, and have no hesitation in saying that our Parisian neighbours have little to boast of over us in the matter; and that as far as we can judge, it does not appear from their own showing, that their peculiar police regulation of prostitution has availed specially with them, either towards diminishing the prevalence of the vice, or towards arresting the diseases which attend it.

> "In Paris" (says Mr. Acton), "among a population numbering 1,500,000 persons, there were 4206 registered '*filles publiques*;' that is to say, one overt prostitute to 356 inhabitants, over and above the unnumbered clandestine ones, who are variously estimated at 20,000, 40,000, 50,000, and 60,000." (p. 19.)

The numbers here given differ but little, in proportion to the population, from those stated above as being the estimated number of London prostitutes.

It must be remembered, in making comparisons of this kind, that in this country men think for themselves, and that their pulses do not throb in quiet unison with the nod of despotism. The vices and the faults, as well as the virtues and good deeds of all—of rulers and of ruled—are laid patent to the whole world. Free report is the life-blood of liberty, the very breath of its nostrils. And in such a land of freedom, where the heavy hand of an autocrat is not present to thrust rudely aside from view the unpleasant spectacle of vice and misery, it naturally happens that the evil deeds of men, rather than their virtues, become prominently noted. With us there is no concealing of the hideous ulcer behind a painted canvas—the very worst of it is bared to view. Where, indeed, can a more remarkable instance of this be found than in the history of the Crimean war? Where a more remarkable proof of the glorious force of a free public opinion? Through such publicity, England possessed at the end of the war the finest army it had ever assembled—perfect in equipment, in health, and in discipline. The silence of despotism reigned throughout the campaign over the French army in the mean time, and annihilated it. It is now only—years after the war has been concluded—that we first learn the extraordinary mortality which finally paralysed the French army in the Crimea, and made peace with Russia a necessary virtue to the Frenchman.

An envious Continental press takes delight in pressing home upon us our shortcomings and our iniquities, and we ourselves supply it with ample food for the purpose. Our worst faults and our greatest evils are laid bare to the gaze of the whole world. We stand daily in the confessional, publicly declaring and confessing our sins. So is it with us in this case, and we need not regret it; happy for the nation that "our sins are not hidden from us," and happier still when men have the courage to own them, and a conscience urging them to remove the reproach!

There is another probable reason, also, why we should be cautious in too readily admitting the fact of an immense spread of the vice in modern times; and the reason is to be sought in the higher tone of morality which now pervades the country, and in man's better acquaintance with its social miseries, and with the duties which he, as a member of it, owes to society. The consequence of all this is, that we hear more and talk more about these things than we did formerly, and may therefore not improbably have fallen into the error of permitting our more ample acquaintance with the evil to imply an actual increase of it.

For our purpose, indeed, the exact statistical facts of the case are of little importance. Enough for us that the evil and its attendant miseries are, beyond all kind of doubting, immense, and more than sufficient to occupy all the energies of philanthropy.

Let us now inquire what are the chief causes which occasion the evil.

A general review of these causes leads us inevitably to the conclusion, that the crime is much more to be laid to the account of the unbridled passions of man, to the disregard of society for its high duties, and to the cruel neglect by fathers and mothers of their children's well-being, than to the vicious nature of the "unfortunates" themselves. That woman, in this matter at least, is much more sinned against than sinning. Let this undeniable truth be brought home to the hearts of benevolent men, and it will assuredly banish thence all the ill-fostered prejudices which would exclude her from the consideration of philanthropy, as being unworthy of its regards.

We have already referred to the fact, that in certain of the low-lived localities of London there are to be met with swarms of prostitutes who are mere children in age. These miserable creatures are, as a rule, thieves as well as prostitutes. Once engaged in the career of infamy, there is no escape for them from its trammels. Vice or starvation, this is the only choice their position in the world affords them. Yet can we with justice call it vice in them? Is it not rather the mere brutal stupefaction of the moral sense resulting from an utter ignorance of what good is, and what evil? Think what their means for knowing better things have been! Lessons of vice they have drawn in, as it were, from the very breast that suckled them. When the first light of reason dawned upon their yet innocent senses, they heard alone the language, and witnessed the vicious ways of beings such as they themselves have now become. These were the examples, these the models, in resemblance of which their plastic minds were formed and matured. The paths of low villany and debauchery were the only ways in which they had seen their fellow-creatures walk. Escape from the life of infamy was impossible; their fall into it a logical necessity. Their bodies were corrupted and drawn already into the abyss of pollution, before yet they were capable of knowing what pollution was.

At whose door is this great guilt to lie? Surely it is the height of unreason to ascribe the crime to the charge of these wretched off-springs of vice, to make them the responsible beings who are to bear the wages of it! It was not vanity, nor the excitement of passion, nor a guilty heart, but their very destiny, which forced them with its iron hand into the shameful trade of lust. Let men think on this, and pity and sympathize with so deep a misery. Spare the ribald jest and withering curse so often flung in wantonness at their importunity, and grieve for the brazen effrontery assumed by childish vice. Turn away from the sight, and mourn over it in sorrow. Thank the kind God of heaven who has cast the lot of those whose virtue is your honour in a happier life, and prove your gratitude to Him by some kind effort for the poor outcast's good.

Another fruitful source which supplies the ranks of prostitution is to be found in the want and wretchedness which press so heavily upon the younger portion of the female sex who live by the needle. Thousands of girls in this metropolis labour from early morn till late eve for wages which barely suffice to supply them with the necessaries of life. Their accidental position, also, continually exposes them to the villanies of the seducer. Is it surprising that under such circumstances—under the pressure of want, and thus sorely tempted—so many of them fall into the snares which surround them? Vanity, doubtless, and love of dress and admiration, powerfully assist the seducer's purpose; but these incitements bear but a trivial part in comparison with the miseries, and wants, and privations their wretched wages subject them to. How many females, again, are yearly added to the long catalogue of sin, who have been cruelly seduced by the lying promises of men from their homes, vilely used, and basely deserted, and at last compelled, through shame, to seek a hiding-place among the dark corners of prostitution!

Thus it is that prostitution is fed with its victims. Some are bred up to the vocation. Misery, want, hunger, and despair drive others to it. Then, again, there are those who are led through vanity or idleness, or thoughtlessness and levity, to take the first fatal step which leads with unerring certainty to the abyss. Shame, or the anger of parents, forbids their return back towards the paths of virtue; and then at last they rush into the maelstrom of wickedness. Few are they who join the throng through an innate love of wickedness, through a natural propensity to sin. "Uncontrollable sexual desires of her own," Mr. Acton truly says, "play but a little part in inducing profligacy of the female."

Such are the principal remote or primary causes which bring woman to prostitution; but there is one immediate and more proximate agency to which we would especially refer—the motive fact which precipitates her to her fall; and this is the uncurbed gratification of his illicit passions by man. See what happens. The weak and wretched one, bred up in vice, or tempted by her sufferings to sin, becomes desperate; no warning voice of friendship greets her ear to tell of better things, and cheer her on with some bright hope; no kind hand is near to guide her steps, tottering on the brink of the precipice. None of these things: but, as if the gate of mercy were doubly barred against her, man is there—the strong and powerful—the tempter, winning her to evil, and ready to take advantage of her weakness and misery. Her very sufferings are his opportunity. Who can wonder if, thus sorely tried, she falls? She falls! and for man's mere passing pleasure is irretrievably ruined! Surely there must be something grossly, radically wicked in the ethics of society which permits the vice—too often the villany—of man to pass unnoticed and unpunished, and allows his triumph over weakness to depress his victim into an abyss of misery. The hard-hearted cruelty of the world's sentence is transparent to the eye of equal justice. The gratification of his animal passions—the natural passions implanted in him—alone is man's excuse; and can such a plea for crime be listened to? What sin is there may not find a justification on such terms as these? The world indeed may lightly pardon him; but most assuredly that Tribunal which apportions out unerring equity to all, will place the black action to its right account. The woman's miseries and her trials, we may well hope will win the recording angel to drop a tear of pardon on her frailty.*

There is in truth a most convenient but very erroneous idea attached, through its conventional use, to the term prostitution. The world is pleased to argue of it as though one party only—woman—were implicated in the vice it represents; as though prostitution were nothing more than the mere sale of her person by the woman. The agency of man in the transaction is kept out of view, as of quite secondary consideration. But to honest reason this mode of viewing the matter is most unjust—cruelly unjust to the woman. Such one-sided interpretations of the vice should be plainly exposed. There must be two parties to every bargain, and the traffic of prostitution demands a buyer as well as a seller; and there are trades to be engaged in which bring infamy on all—infamy on the buyer and infamy on the seller; and can any trade be more iniquitous than this, when measured in accordance with the plainest dictates of religion, of morality, of reason, and of honour, apart from the false colouring with which the sophistry of the world, for its own convenience, has surrounded it? Writers pass too slightly over this cause of prostitution—this victimizing of the woman by man. We consider it demands especial condemnation, as being the most powerful and the most unpardonable of all. We dwell upon it, because the study of the history of prostitution has forced upon us the conclusion: that the main remedy for the lessening of the social disease is to be found alone in a higher development of man's moral nature—in the practice by him of those self-imposed restraints of the passions which, while they mortify the body, elevate the better part of him—in the sacrifice of his own desires when the welfare of others demands the sacrifice.

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* "If," says Paley, "we pursue the effects of seduction through the complicated misery which it occasions, and if it be right to estimate crimes by the mischief they knowingly produce, it will appear something more than mere invective to assert that not one-half of the crimes for which men suffer death by the laws of England are so flagitious as this."

Such are the chief causes of prostitution, and their investigation naturally indicates the remedies appropriate for their removal. These we will now proceed to consider, by determining what are the duties, firstly, of the individual, secondly, of society, and thirdly, of the civil power, in reference to prostitution.

In considering the causes of prostitution, we unhesitatingly agreed with Mr. Acton, that "the major force of prostitution comes, except in extraordinary cases, by the desire of the male." This being admitted, the chief indication for cure becomes manifest: "If we were forced," he says, "to adopt preventive measures against this plague, instead of sackcloth and ashes for its arrest, we should find there was no better chance, and no livelier hope of diminishing the supply of prostitution, than by operating against the demand."

Mr. Acton's views, "visionary or otherwise," as he says of them, concerning the prevention of prostitution, are contained in his ninth chapter. They form, in our opinion, the most interesting portion of his book, and are well worthy attention. To attempt to purify the morals of mankind by acts of Parliament, he admits, is a dreamer's scheme. He would have the problem of such moral regeneration worked out by the struggles and energy of the individual himself, and especially by lessons taught in early life.

> "The mind of the young—whose vices, like those of adults, are ignored by society, and who obey the promptings of instinct until the gates of reflection are opened, perhaps for the first time, by suffering—is admitted by all to be the proper battle-ground of religion against sinfulness. On that same field, I say, would be opened just as appropriately the first campaign of virtue against vice." (p. 161.)

You must train up the youthful mind to habits of continence. You must recognise in your systems of education the fact, that passions are instinctive in youth; and cease the folly of ignoring what is universally true. You must remember that these passions are parts, necessary parts, of man's perfect nature; and that when duly disciplined, they bring great happiness upon him, but misery when left to rage uncontrolled. To meet these facts, Mr. Acton proposes to introduce a system of "sexual education or training to continence;" unless this is done, he says, "no material head will ever be made against prostitution." And the lesson must be commenced in early life, for though "the heart of the child is wicked, his mind is a fair book, on which he who will may write some lasting record." This passion is imperious, he argues, in the human body, and will still trouble the individual, despite all abstract religious teachings. The masters and instructors of youth may pass over its existence in silence, but they will not thereby arrest its actions. Is this wise? Would it not be much more reasonable, that the kind tutor should point out to the pupil the snares and pitfalls which, through its influence, will soon beset his path—that he should anticipate "the instructor in vice, who is ever at hand to the young?" The youth is taught the beauty of virtue, and the deformity of vice, in the abstract; but what sort of armour is this instruction to shield him against the temptations of lust, which surround his steps, and, syren-like, beckon him on to sinning when he comes forth into the world his own guide and monitor?

More than this. Is it not folly to pass over without recognition the sexual malpractices of youth, when we have before us so many proofs of the serious amount of misery which results therefrom in after life? Forewarned is forearmed, and this forearming must be derived from "the introduction of worldly-wise and physico-moral training into the curriculum of modern education," for "the moral and religious curb has proved itself to be of slow growth and of limited efficacy." Through a mistaken idea of modesty, we leave the youth to go forth unprepared to combat a terrible enemy, and gain his experience in the world as best he may; we send him out into the midst of temptation, the strong passions of his age urging him on to sin, with not one word of solemn caution, or paternal warning to direct his doubtful steps.

It may be fairly asked of those who consider that it would not be well to take any account of the *idées génésiques* in the education of youth, whether the system hitherto adopted has produced among the rising generation desirable consequences; whether abstract moral training has been of any avail in enabling the youth when thrown into the ways of temptation to resist the evil? But after all, wherein can lie the danger of parents and tutors cautiously explaining this lesson of the book of life to their children and pupils?

Let them, says Mr. Acton, "show, by degrees proportioned to the age of the pupil, the worldly impolicy, as well as the impropriety, of vice." And he would have science cooperate with religion in the instruction of youth, so as "to administer the proper antidote before the "leprous distilment" of moral poison has been poured by the many agencies of the world into the ear of the child."

We can well understand that great difficulties must of necessity meet the instructor when he would impart such kind of advice to youth, but the difficulty is one which may possibly be overcome by prudence. But none of the difficulties here suggested meet us in the education of adult youth; and no one will plead modestly in their case, as a bar to what Mr. Acton calls "anti-sensual instruction."

To such Mr. Acton would boldly teach the miseries which a life of vice entails; he would strip the gilding from the attractions of vice, and expose the horrors lurking beneath. Through the agency of the educational classes now spread through the country, he would have the lesson taught; indeed, on them he mainly relies for the diffusion of knowledge about self-regulation and the control of the passions. He admits that a spread of education has improved the habits of a large class of the youths of this country, and through its extension he hopes for a further advance in the special matter of this sensual passion. He would have them instructed on "training to continence, on the worldly evil attendant upon adultery and fornication, and on the duty of marriage." Public libraries, debating classes, chess clubs, and educational institutions, are the battle-field wherein these men should be taught, and indeed are being taught, to fight against the flesh. "Every hour spent in such intellectual amusement is an hour saved from idleness, and what is more, from idleness at night, the great ally of vice and crime." Gymnastic exercises, too, must not be forgotten, for they "go a long way towards the work of self-restraint in the adolescent, and generally during childhood fully balance the *idées génésiques.*" All this is in distinct accordance with facts taught us by physiology; and we cannot forbear quoting on this head some remarks by Dr. Carpenter which are well worthy of a place here.

"The sexual secretions themselves are strongly influenced by the condition of the mind. When it is frequently and strongly directed towards objects of passion, these secretions are increased in amount to a degree which may cause them to be a very injurious drain on the powers of the system. On the other hand, the active employment of the mental powers on other objects has a tendency to render less active, or even to check altogether, the processes by which they are elaborated. This is a simple physiological fact, but of high moral application."*

To those who urge the wants of nature as an excuse for the illicit gratification of the sexual passion, he says (addressing himself in this case to the student of medicine):

"Try the effects of close mental application to some of those ennobling pursuits to which your profession introduces you, in combination with vigorous bodily exercise, before you assert that the appetite is unrestrainable, and act upon that assertion. Nothing so much tends to increase the desire as the continual direction of the mind towards the object of its gratification."

It certainly must be admitted, that the absence of education upon this subject has neither suppressed nor diminished prostitution; and there is, on the face of it, indication clear of something very wrong in a system of instruction which, by the tacit admission of the teacher, turns out youth perfectly unfitted to cope with the temptations awaiting him. A complete condemnation of it seems involved in the fact, notorious to every one, and alluded to by Mr. Acton—viz., that the master of the first school in this country forbad his pupils to assemble in London at their annual cricket-match, through dread of the effect upon them of the contaminating influences which would surround them in the metropolis. The prudery and absurdity of the proceeding is manifest in this, that, as a matter of course, these same youths would in a very short time be thrown upon the town, their own entire masters. Surely it would have been wiser to have prepared such youths for the temptations which inevitably await them, than to keep the temptations from their sight for the moment only.

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* Principles of Physiology, p. 859.

With still greater force does the argument for the necessity of such a training apply in the case of advanced *alumni*, the dwellers in our universities—

> "Who are by courtesy considered men, and, indeed, during no inconsiderable portion of the twelvemonth, have more than all the leisure of full-grown adults—all the self-confidence natural to their age, and all its liability to temptation.
>
> "Is it not inexcusable that in these quasi-monastic institutions the continence of all classes should be left to chance—*i. e.*, left alone? and that the possibility of aiding discretion and restraining indulgence by education and advice should be forgotten, or, if remembered, glossed over?" (p. 168.)

If any show of reason might be suggested against the giving such instruction in earlier life, none surely can be offered here. Through its influence Mr. Acton opines that:

> "Our profession would see fewer instances of wasted minds and battered frames; society would have fewer unaccountable celibacies and scandalous marriages to wonder at; and a certain blow would be given to the great hold of prostitution, which, if the same society but lent its proper aid, would be the more effective." (p. 169.)

The ill effects of this ignoring the existence of the passion and its physiological laws, we may add, make themselves felt not alone among the *alumni* of universities. We have reason to know, from unimpeachable authority, that the "*quasi-monastic*" life generally led by men in authority there, has brought many a one of them into habits which we, as physicians, know usually have but one issue—irretrievable misery—for the practisers of them. Naturally, medical practitioners are better acquainted than any one else with the fact of the great prevalence of this abominable vice of self-pollution, for they are daily called upon to administer to its direful consequences. Who, then, so well as they, are able to impress upon the minds of the directors of youthful minds the necessity for attempting by some means to ward off the baneful habit, which, contracted in early life, and unchecked,* is continued afterwards, and finally degenerates into an incurable vice?

We have lingered long upon this subject of education as a means of restraining prostitution; and we heartily join with Mr. Acton in calling the attention of those who have power in influencing the education of the youth of this country, to a serious consideration of it. The conclusion which has been forced upon us whilst engaged in this investigation, entirely coincides with the opinion of Mr. Acton—viz., that the chief blow which is to be struck at prostitution must be dealt out here, in the better education and direction of the minds of young men. Whoever attempts to make an educational movement in this direction, will undoubtedly have many obstacles to encounter, for there are plainly great difficulties inherent in the subject, thus considered, besides many prejudices to be overcome. But we cannot doubt that perseverance will eventually crown his efforts with success, and for this reason,—that the principles and reasons upon which such a plan of education is based are true, and consonant with the laws of our moral and our physiological natures.

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* We are informed by the high authority of Dr. Sutherland, that the greatest number of cases of *nervous exhaustion*, which come under his care proceed from venereal excess. And Dr. Webster assures us, that in Vienna and in the South of Europe, the chief cause of *insanity* is venereal excess.

And while speaking of the duties of the individual in reference to prostitution, we would seriously call the attention of every conscientious man to one or two particulars which, though on the first glance they may seem trivial, are, when fairly considered, manifestly promoting causes of prostitution. In the first place, we will allude to that easy and familiar manner of discoursing upon the subject so common among men in social life. When young men, just entering into the world their own masters, listen to those jesting words which fall from the lips of their seniors, they naturally come to consider this illicit gratifying of the passions not as a vice, but as one of the ordinary affairs of life. Instead of hearing it stigmatized, as it intrinsically deserves to be, they find it regarded as a very trivial matter by those whom they are ordinarily accustomed to look up to as authorities. Such conversation paves the way to sinning for the uninitiated, and confirms those who are already engaged in the error; and is thus an indirect mode of encouraging prostitution. In this matter every one may work a good part. Let this topic never be discoursed on except seriously and subduedly. Let it not be lightly introduced into society, nor listened assentingly to when jested upon. Let all such ribaldry be met with the reprobation of silence, and banished from decent life. We confidently appeal to every one of our readers in this matter, certain that their conscience will respond approvingly to our appeal.

Then, again, we would press the argument home to those who, though not approving, yet palliate the vice, and excuse themselves in the commission of it. They see no serious wrong in it, because they did not occasion, but only accepted the mischief as they found it. And some who reason thus would shrink with horror from the thought that their profligacy had added another outcast to the throng of lost ones. They argue: that prostitution is a fact almost coeval with the creation of mankind; the earliest records tell of its existence; in all countries, during all ages, and at all times, the vice has been found a constant attendant upon human society, and must be therefore submitted to as a necessary evil; it has always existed, and will continue to do so, as long as human nature is corrupt; the passion which leads man to the vice is implanted in him; and its gratification therefore permissible. This arguing may appear plausible to some, but it is in reality nothing but a compromising with conscience—a sop thrown to still the urgings of that inward monitor, which yet will not be wholly silenced. Men may strive to twist the matter to fit their fancy or their wishes; but the flimsy veil is blown away by the first breath of honest argument. Reason tells us that every act of such debauchery increases prostitution, and tends to the seduction of the innocent, by increasing the demand for the supply of the victims of man's lust; and that the supply follows instantly upon the demand.

We must not leave this part of the subject without saying a word to those of our brethren who think themselves justified, for certain special purposes, in prescribing the act of fornication to their patients. We feel constrained to call attention to this matter, because we know that such advice is frequently given by members of our profession. A full consideration of the facts of the whole case will make plain to every conscientious man the gravity of the error involved therein. In the first place, it has yet to be proved that such advice is ever needed—whether there is any disorder which is certain of finding relief from it. And then, even if good effects were shown to result from it, the prescription still remains most unwarrantable. Man is not a mere brute agent. His existence here is not solely an animal life. He has a far higher object and calling to pursue than the mere culture of his bodily frame. His conscience tells him that evil done for the sake of gaining good is evil still, *hic et ubique*. It is stigmatized as such by an Authority to whom we all submit. He, then, who gives advice that leads to fornication, doubly errs in that he thereby sins himself, and occasions sin in others, directly encouraging prostitution. Surely the soul and body of the wretched outcast who is to be made use of in this light way, ought to be as much a matter of concern to him in such a case, as the body of his patient. Why should she be sacrificed for the supposed temporary gain of another? See into what degradation he would abase the fallen one! He would have her used as a mere vessel fitted only for pollution, as a material article to be converted to the uses of his patient!

Then, again, can he ever calculate beforehand the amount of wretchedness into which this deviation from duty may lead his client—all the miseries which may be entailed upon the scholar thus initiated, perhaps, into the winning ways of the vicious syren? Into what depths of moral and physical sufferings he may not thereby be the cause of plunging his patient? He to whom such advice is tendered, may possibly have heretofore kept himself free from the offence. He is now first authoritatively inducted into the path of error; the *facilis descensus* is laid wide before him, and it is certain that in this particular gratification of the animal nature, "increase of appetite grows by what it feeds on." Whither, then, may not a first false step lead the ill-advised one?

"Of this passion it has been truly said, that irregularity has no limits; that one excess draws on another; that the most easy, therefore, as well as the most excellent, way of being virtuous, is to be so entirely; that the criminal commerce of the sexes corrupts and depraves the mind and moral character more than any single species of vice whatever. That ready perception of guilt, that prompt and decisive resolution against it, which constitutes a virtuous character, is seldom found in persons addicted to these indulgences."*

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* Paley.

Need we add more, to show the grave responsibility which rests upon those who prescribe such a method of cure as this to their patients under any circumstances whatever?

But it is not alone in these ill-conducted passions of the individual that we are to seek the causes of prostitution. Society, neglectful of its duties, itself indirectly provokes the evil.

> "Supposing" (says Mr. Acton) "the demand for prostitutes to have been in some measure checked by moral and physical training of males, the most obvious checks upon the supply in the power of society are, a modification of the restraints now imposed upon lawful wedlock among the educated classes, and a graver treatment of seducers and deserters of women. The measures which the State should adopt in the same direction are, the punishment of seducers, continued improvements in the dwellings of the poor, higher education of poor females, and larger encouragement of colonization."

We have already referred to the fact, that large numbers of females are driven to the practice of the vice or fall into its snares under the pressure of want and misery. Now it is evident that an intelligent society, in so far as it has the power of removing the evils which press thus heavily upon its poorer and weaker members, is answerable for the crimes which are engendered through its negligence, and it is certain that it has a heavy reckoning to pay in this matter. Happily, in these last days, men have awakened from the disgraceful lethargy of past generations, to a sense of the responsibility which their social duties impose upon them; and we may hope now to see the fruits of this new life in an alleviation of many of those miseries which drive the less favoured of the world to the desperation of crime. Upon this part of the subject we shall not linger, for the duties indicated herein as appertaining to society, however ill performed by it, are denied by no one. To one point, however, we must especially allude, and that has reference to the treatment of the seducer by society. If to be numbered among the class of prostitutes be the lowest degradation into which woman can fall, what must be the guilt of the man who brings her to that pass? And yet how does society show its resentment? It drives the woman from its presence, utterly and for ever; but receives with a friendly hand and with its wonted greeting him who enticed and deceived her. How long will it be guilty of this gross injustice? If it did its duty, it would resolutely brand with its scorn the known reprobate; it would exclude him from its intercourse, hold him in the light of a dishonoured man, and make the penalties of the law bear heavily upon him. It would thereby tend to discourage a sin which it now in this respect distinctly fosters.

One word also we must add concerning the luxurious habits of the age, in so far as they encourage prostitution by unduly interfering with marriage. That tyrant, the fashion of the world, is thus indirectly no mean promoter of prostitution. Stronger than the law of human nature and the law of God, it has decreed that marriage is a luxury which, in a certain class of society, shall be indulged in only by a few. It has created a world of artificial wants and artificial necessities, and has decreed that he who does not dwell within the magic circle shall not enjoy domestic life. Luxuries which yield no happiness, and the power of encompassing pleasures that leave the mind still unsatisfied, have been made necessary adjuncts to modern married life. How long will men submit to the tyranny of being ashamed to be thought poor? "The hardest part of poverty is the ridicule which attaches to it." "*Paupertas nihil habet durius in se quam quod homines ridiculos facit,*" was one of the sighs of the heathen world; and eighteen hundred years of Christianity have since rolled by, and yet have worked no better sentiment in us! Imperious fashion still holds its own.

We have alluded before to reformatories and houses of refuge for prostitutes as means of alleviating or diminishing prostitution; and can only repeat that their benefits are very doubtful, and certainly most minute. Benevolence so directed is not directed to its best purpose. What consolation can we derive, therefore, when we know that if by their aid some poor creature be now and then snatched from the wretched life, the place is instantly filled up by a fresh recruit? Reformatories diminish in nothing the demand; and it is certain, as society is now constituted, that as is the demand so is the supply in the matter of prostitution. It is cruel to destroy the illusions of benevolent hearts; but it is folly for those who have a mastery of facts not to express them boldly.* The duty of society, then, in this business, is well defined. It has to carry out the removal, as far as may be, of all those causes which lead, or rather drive, so many women into the ranks of "unfortunates," rendering them the ready victims of the lust of man. The efforts of benevolence made in this direction are efforts made aright, and are certain of being followed by good results.

We have thus seen what may be done by the individual, and what by society, towards diminishing prostitution; and we will now consider shortly, what seems to be the duty of the legislator, as guardian of the health and morals of the people, in regard to the supervision or regulation of the vice.

It is quite certain that the introduction into this country of police regulations such as prevail in most towns of the Continent, would never be submitted to. The genius of the people, their inborn spirit of liberty, are entirely opposed to all such interference. And so also is the moral sense of the country. Nor can we see anything to regret in the fact. External decency, it is true, may be better maintained when prostitution is brought under the immediate supervision of the State, and some of the outer evils which attend upon the vice may be diminished or assuaged by such interference; but assuredly there is a natural feeling, a conscience which warns us that the recognition of prostitution in this wise by the rulers of a country, has within it that which is repulsive to a high morality. We have indeed a curious sort of exemplification of this in the case of the Papal States, where prostitution is not permitted to participate in the fatherly attentions of the Government. We may be sure that the exemption does not proceed from any respect for the freedom of the individual—the idea of personal liberty being a rare fact among the items of social life in those States. It is founded, as M. Jacquot tells us, on the principle, that it would be indecent "for Christ's vicar on earth to permit the violation of one of God's commandments in his States." (Duchatelet, ii. p. 848.) Why the violation of the commandments should be tacitly overlooked by the eye of infallibility in other countries in which his Holiness is the recognised interpreter of theological subtilties, remains to be explained. M. Jacquot of course looks upon the matter with a Frenchman's eyes. He has the most profound belief in the excellence of all French institutions, and thinks that "the state of society in Rome is capable of great improvement, and that the establishment of houses of prostitution there would be followed by very beneficial results, both to the bodily health and the morality of the people." But, like a true son of the Church, he admits that he is incapable of solving the difficulty as regards the Pope's dominions, inasmuch as the question has a touch of theology in it.

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* At Brussels there is a house of refuge, called "Couvent des Filles Répenties." It is admitted to be a failure. When "*suffisamment corrigées et décidées à se conduire honnêtement,*" the women are allowed to leave the house; but it is only "once more to figure on the registers of prostitution."

They who patronize this institution, says Dr. Marinus, should begin at the other end. They should offer an asylum to those who through misery and want are brought to the fatal brink, and are still lingering at the precipice of prostitution. (Duchatelet, ii. 748.)

We ourselves are inclined to believe that the recognition of prostitution by the Government, quite independently of its immoral character, tends in some degree to encourage the very vice it would control; and that it does so in an especial manner in those countries where the ruling power is regarded by the subject as a sort of guardian angel who sits up aloft constantly watching over his interests and providing for his wants. The provision made by a Government for the proper maintenance of prostitution, converts it into a State institution—makes it an integral part of the State policy. It advertises distinctly enough to the citizens the opinion of their Government upon the subject—viz., that prostitution is an evil necessarily appended to civilization, and is to be provided for the people and regulated at the expense of the State, just as theatres, circenses, and public amusements generally are provided.

Now the natural result of this is, as we conceive, directly injurious to the morals of the country. Individual members of society, arguing upon the above facts, find in them a placebo to quiet those prickings of conscience which might perchance have availed to restrain them from the commission of the act; the sin, at all events, a man might say, cannot be very great, for otherwise our paternal government would hardly have charged itself with the superintendence of the means for its accomplishment. And exactly the same mode of reasoning might operate upon the mind of the unfortunate woman who is about to inscribe her name upon the rolls of prostitution. She finds the way, as it were, paved for her purposes; her last lingering scruples would be removed by the thought that she is, after all, only becoming a member of an institution expressly provided by the care of Government.[*] And if we look to facts, we shall find that this State interference is, after all, nothing but a screening of the vice from view. If we consult Duchatelet on this head, we shall be forced to admit, from his own showing, that it avails nothing, either in diminishing the spread of the vice, or in arresting the supply of victims which feed it.

> "Clandestine prostitution, that which is exercised in secret, and unknown to the police" (he tells us) "is of far greater importance than public prostitution. Through it innocence is perverted and corrupted; it braves and paralyses authority, and propagates with impunity the most fearful contagion and the highest immorality." (vol. i. p. 471.)
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> "It is not in the licensed houses that young girls are ruined, but in the houses where clandestine debauchery is carried on; it is here that they are seduced, prepared, and fashioned to the ways of prostitution." (vol. i. p. 477.)

By the same means also, he tells us, syphilitic diseases are spread, and the wise measures of the Administration rendered all but useless.

Now, when we consider that the number of these clandestine prostitutes is, according to high probability, ten times greater than the number of the prostitutes who come under the immediate regulation of the police, we see at once how utterly inefficacious is such organized interference with prostitution; how useless it is either as a means of preventing the spread of prostitution, or of the diseases which accompany it. M. Duchatelet appears himself to admit the failure, and the remedy which he recommends to meet it, is to multiply the houses of prostitution!

Neither is that opposite extreme of arbitrary interference, which refuses even to recognise, or rather altogether ignores, the existence of prostitution, which proscribes its haunts, and tracks and incessantly hunts it forth from place to place, of any avail in scotching the viper. Let us, for example, see what is the moral condition of the people in the Papal States, where such a system of violent repression is practised. We have to guide us here an undoubted authority—M. Jacquot—who during four years was physician to the French army of occupation in Rome, and who made an especial study of this subject. "If," he says, in his very interesting report, "men were perfect Christians, there would be no such thing as prostitution, because then the law which orders mortifying the flesh would be rigorously obeyed." 'Mais cette cité de Dieu semble malheureusement devoir rester une simple aspiration pour l'humanité." From the earliest ages prostitution has existed in Rome, and has been continued down to our own time by an uninterrupted chain of metamorphoses. "Au moyen age bien des vices ont souillé Rome." During the Renaissance the vices of men were, like their virtues, grand and magnificent.

> "On retrouve le règne de ces courtisanes à la mode antique. Si on excepte l'austère et grande figure de Michel-Ange, chaque peintre avait sa Fornarina

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[*] "The avowed toleration," says Paley, "and in some countries the licensing, taxing, and regulating, of public brothels, has appeared to the people an authorizing of fornication; and has contributed, with other causes, so far to vitiate the public opinion, that there is no practice of which the immorality is so little thought of or acknowledged, although there are few in which it can more plainly be made out."

avouée, chaque poëte sa Fiametta bien connue. . . . Plus tard la fameuse courtisane romaine Imperia, l'amie des Sadolet, des Beroalde, des Campani, &c., obtint les honneurs d'un tombeau à l'église de Saint-Grégoire-le-Grand. . . . . Il y a une centaine d'années, c'était les dames du grand monde qui défrayaient par leur galanterie les passions de la jeunesse et les débauches de l'âge avancé. . . . . Rome et l'Italie ont été longtemps aussi la terre classique du sigisbéisme—la prostitution domestique assise au chevet conjugale et tolérée par le mari."

Now, however, all this is changed. Vice has descended "d'un et même de deux crans sur l'échelle sociale." Princely families are all virtue; and vice ferments only among the dregs of an ignorant and corrupted population, "et gangrène aussi la partie inférieure de cette classe moyenne de la société qu'on appelle partout la classe aissée."

M. Jacquot then goes on to tell us, that because no legal provision is made for the practice of the vice, no

> "Emonctoire de précaution, ... à Rome la prostitution est un peu partout: elle s'exerce, par malheur, trop souvent dans la famille, sous les yeux des parents, presque comme un métier avouable, et parfois la mère vous introduit chez sa fille, la jeune sœur, qui attend son tour, vous mène a sa sœur adulte, et le petit frère vous éclaire dans l'escalier."

The wife, too, he tells us—

> "Chaude encore de baisers adultères, sera bien reçue dans l'alcôve conjugale si elle apporte un bon pécule au bout de la semaine. Tel est le marché honteux, dégoutant, &c. . . . . J'ai longtemps refusé de croire à tant d'ignominie; aujourdhui je n'en suis que trop convaincu.
>
> "Comme complément de cette peinture des mœurs romaines signalons en deux mots une cause qui contribue à jeter une teinte spéciale sur la moralité publique à Rome. Nous voulons parler de la prélature des cadets et du nombre proportionellement plus élevé qu'ailleurs des établissements destinés à recevoir des hommes voués au célibat."*

Such is the picture of the back scenes—the moral *chiaro-scuro* of life in modern Rome, drawn by the hand of an unimpeachable but not unfriendly witness. It portrays a state of things which differs widely (and therefore we have inserted it here) from those 'joyeuses," demi-pious, demi-romantic descriptions with which we are periodically favoured by certain reverend pilgrims and small literary *dilettanti*. These gentry tell of the benign and austere excellences, *à l'antico romano*, of the "great ones of the Roman city," and of the simple virtues and pure lives of the undercurrent classes of that same society; and then, antithetically, display in sorrowing truthfulness the baseness and corruption which prevail universally in their own country, to the scandal of Christianity.

In Austria, again, where the Government is equally straitlaced in keeping up a smooth external conformity with virtue, an enormous amount of vice lies fermenting under the surface. It is the old tale of the whitened sepulchre over again, the affecting a virtue without the having it. According to law, there are no public brothels in Vienna, and prostitutes are sent to the house of correction; but

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* A well-authenticated fact which has come under our own notice, enables us to corroborate this statement. A high-minded Englishman, who studied for the priesthood in one of these colleges a few years ago, quitted it and the profession abruptly, through disgust at the propositions made to him by some of his spiritual pastors and masters.

practically there exist at the lowest calculation, Mr. Wilde tells us, 15,000 public women in that city. Everything relating to this business is kept smooth on the surface. "The disgusting exhibitions," he tells us, "witnessed in the capitals of Great Britain, are not permitted by the Austrian police." But, then, see the reverse of the sketch:

> "Notwithstanding the apparent moral condition of the city after nightfall, which must at once strike a foreigner, I am much inclined to think that the public exhibition of vice is often a test of private morality; as instances *pro* and *con*, I might adduce the cities of Rome and Vienna on the one hand, and Dublin on the other."[*]

As a corroboration of Mr. Wilde's views regarding Austrian immorality, may be mentioned the fact stated by him—viz., that in Vienna nearly one of every two children is illegitimate, a fact

> "Only surpassed in Munich, where it is recorded in 1838 the number of illegitimate exceeded the legitimate by 270; and yet in that goodly city public women, as well as tobacco-smokers, are not allowed to appear in the streets."

These facts tend plainly to show that police supervision of such a nature in no way serves the public good; and we have seen how opposed they are to morality and to the liberty of the subject.[†] It is certain, at all events, that so long as Englishmen have a respect for personal liberty, the laws affecting the public disorders incidental to prostitution will in this country only be framed on the principles of those now existing. But much may be, and in fact through the pressure of public sentiment is being done towards lessening the grossness and scandal of the disorders exhibited in public by prostitution. And we may be sure that, in accordance with the higher tone of morality pervading modern society, further advances will still be made in the same direction.

The duty of the Legislature is well defined. It has to provide for the observance of public decency, and the suppression of vice and immorality, so far as may be done without unduly interfering with individual liberty; and it has already armed the civic force with powers equal to the purpose. Those powers, indeed, reach further than the magistrate thinks well to stretch his arm. "Every common prostitute or night-walker," for example, "loitering and soliciting for the purposes of prostitution," is liable to arrest and fine under the Police Act. But when such cases have been brought before the magistrate, he has hitherto evaded the infliction of punishment; for, it has been asked, how can you be sure from the mere fact of loitering, &c., that the woman is really a prostitute? Mr. Hardwicke, moreover, refused to inflict the fine on one occasion, because, he argued, if we punish at all, we must fine every street-walker in London, and not a few only. (Acton, p. 109.)

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[*] A friend, intimately acquainted with Germany, assures us that the sale of children by their parents goes on in Vienna, just as described by M. Jacquot in Rome. This fact tends to illustrate the *unity* of the human race. Christian mothers, under the immediate eye of the Pope and of the eldest son of the Church, practice the same habits as the lowest savages do (according to Dr. Barth) in the centre of Africa.

[†] Mr. Wilde tells us that in Vienna, "all persons considered of an improper character" (the Austrian *mouchard*, of course, making the diagnosis), "when found in the streets after a certain hour, are conducted to the police office, and if on examination found to be diseased, are at once sent into hospital." (Acton, p. 89.) This is our Habeas Corpus Act turned exactly upside down, and therefore very ill adapted for the land of Magna Charta.

But this sort of reasoning is manifestly a mere excuse. Prostitutes are as well known to the police as members of the swell mob are; and the police are no more likely to make mistakes in dealing with the one class than the other. Only let public opinion cry out loud enough, and the magistrate's hand will fall heavily enough. The police have power to put down gaming and betting houses, and to enter shops and capture wholesale the filthy pictures and literature which incite men to vice; and they have powers to arrest the flagrancy of street prostitution. They have exercised their powers most beneficially in the one case, and they will exercise them equally so in the other, *whenever society demands that they should do so.*

And when things have come to this pass, that a man cannot walk along some of the fashionable thoroughfares of this city in open day, in company with his wife and family, without being met with the most glaring exhibitions of prostitution, chiefly, we are glad to say, importations from the other side of the Channel—without having his feelings outraged at the sight—he surely has a claim to protection. Society, moreover, has a right to demand that its members, especially the young and inexperienced, shall be protected against such flagrant temptations to sin. Can any one doubt that many daily fall into the snare simply because it is thrust into their path—the vice seeking them, not they the vice? "Lead us not into temptation," is our daily prayer; and the duty which flows from it, in this case at least, seems clearly marked. Obscene works and pictures are forbidden because morality is injured by them. Why, then, should the obscene realities, which they lead to, be permitted openly and glaringly to offend society?

Mr. Acton suggests the adoption of modified "domiciliary visits" by the police at the houses of prostitutes; but the very words make an Englishman's ears tingle, and we hope that such means of regulating vice, which eminent judges have declared as "contrary to the spirit of the English law," may never find favour in this country. We must trust in this matter to that force which, both for evil as well as good, is omnipotent in England—the force of public sentiment. The degree and extent of prostitution are just the measure of the viciousness of the age in which we live; and we may be sure that the vice will gradually vanish from the scene in proportion as men become more virtuous, and only so. From the private virtues of individuals, public opinion derives all its goodness and all its power of action. The severity of the laws had no effect in arresting the hand of the duellist; the first men in the land, despite of those laws, recommended duelling to their fellow-subjects by themselves practising it. Public opinion put down the custom by proclaiming it a contemptible sin. And just in like manner it has extinguished slavery, which, on the other hand, was actually patronized by our laws, and was regarded as a most legitimate object of traffic by our leading merchants. And public opinion is daily strengthening the arm of authority in its crusade against vice, and all that fosters vice; and we see with satisfaction proofs of the good effects resulting from those efforts. Mr. Acton himself admits that the police have power sufficient to abate the public disorders incidental to prostitution; for he tells us that disorders are at present merely "nominal" in a street where they were once notoriously great, and all this through the vigilance of the police of the C division.

Prostitutes who commit irregularities in public, subject themselves to the same penalties as all other persons are liable to who offend public decency. And we may indeed well be cautious in permitting any laws to be passed which shall specially affect them, when we find such peddling modes of dealing with the vice as the following recommended by an authority like Mr. Acton. He would, to disperse a number of loose women who encumber the "*trottoir*," as he calls the pavement, have the "*troupe*" followed industriously up and down by

> "A service of constables, numerous, and not secret, but flagrant in their uniforms, notice being given that this measure would be continued until they (the females forming the *troupe*) extended their radius from two hundred yards to two miles. No customer likely to be profitable would accost them under such a *surveillance*, and I am convinced that they would be starved into capitulation." (p. 113.)

Tricks of this sort are ordinary emanations from the brains of irresponsible *sbirri;* but most assuredly they can only be put in practice where personal freedom is an unknown quantity in the commonwealth. Their existence necessarily indicates an arbitrary power vested in the police such as would be perfectly insufferable with us. If Mr. Acton, after due deliberation, and with all his knowledge of the subject, can recommend no better remedies for the evils complained of than domiciliary visits, and a system of public bullying of prostitutes, it is clear that there is very little left by the legislator undone, which it is possible for him to do in the matter.

We must now say a few words on the subject of the sanitary measures which seem best adapted (in accordance with the sentiments of the country) for the purpose of arresting and curing venereal diseases. And we may remark *in limine*, that all police meddling here is quite out of the question. Mr. Acton may be well assured that the face of things will have undergone a total revolution, and not for the better, in England, before the "repression of syphilis" is taken under the care of the State. We have already seen, independently of other objections to such interference, how vain are all attempts to arrest the spread of these diseases by acts of Government in countries where the most rigorous sanitary measures are prescribed and enforced.

Putting aside, then, the idea of establishing any regulations for legally repressing the spread of venereal diseases in this country, let us consider what is the course a wise society should follow in order to protect itself against the consequences of the evils engendered by them.

It is evident to all who will reasonably study the question, that for the good of society at large, every proper facility for cure should be afforded to those who are affected with venereal diseases; and especially so because the disease is contagious, and may become hereditary. Now we certainly feel bound to confess (despite of Mr. Acton's declamations against our shortcomings in this matter), from the facts before us, that the public charities of this metropolis afford as great facilities for the cure of venereal diseases as they do for the cure of other diseases. When we find, for instance, that nearly one-half of all the out-door surgical patients of our metropolitan hospitals are patients suffering from venereal diseases, we think we have a sufficient answer to Mr. Acton's complaints. He himself tells us that, "the last year's operations of this institution (Bartholomew's) against venereal diseases cannot, at the lowest computation, be said to have extended over less than 12,000 cases." From this simple fact some idea may be had of what is really done in the treatment of these diseases by our numerous public charities. This at least is certain: that as far as out-door aid is concerned, there is no impediment whatever thrown in the way of any person affected with venereal disease obtaining advice and treatment.

Whether venereal diseases are more common or less frequent now than they formerly were, is a point impossible to decide; Mr. Acton admits, at all events, that they are much less severe now.

> "Truth demands the acknowledgment that the individual affections, both in England and on the Continent, are less severe in the present day. In but few cases do the symptoms run high, or is the patient permanently crippled by the disease. I myself can testify to enormous changes in this respect during the last twenty years . . . . thanks to the improved treatment, and the many channels of relief available to the poor, these wholesale calamities (phagedæna, &c.) are put a stop to."

This is a strong answer to Mr. Acton's complaints of our neglectful treatment of these diseases. All the additional hospital accommodation indeed, which he demands for London, is 500 beds, 300 for women and 200 for men. He proposes that a venereal hospital of these dimensions should be kept up by the public purse; but this scheme is evidently impracticable. Is it likely that Liverpool or Bristol or Edinburgh will consent to pay for curing the diseases of the prostitutes of London? Or does Mr. Acton propose that a public venereal hospital should be established in every town in England? As to raising the requisite funds by private subscriptions, he admits that this is quite out of the question in the present state of the public mind on this subject. And truth to say, our own opinion quite goes with the public in this matter; for though we agree in the great desirableness of such an institution, we know that there are numerous neglected objects of pity more requiring the consideration of the benevolent. And while so many of our large hospitals are struggling for existence, and their benevolent purposes starved through want of funds, we can never patronize the turning of money in this direction.

Victims of venereal diseases are at all events not more worthy objects of commiseration than victims of phthisis; and really, when we consider that the last refuge for the bulk of the poor so afflicted is the poor-house, we cannot understand why it is not a refuge sufficiently good for the former class of diseases which require in-door treatment. Let us be just to prostitutes and their paramours, but not act the part of mealy-mouthed philanthropists. The objection to the admission of prostitutes into hospitals where wards are not specially provided for their reception is founded in reason and justice. Is it right to subject the honest and respectable class of poor—the special occupants of hospitals—to society of this kind? The answer is clear. And the truth is, that the cases of primary syphilis which require in-door hospital treatment are very exceptional. All cases of gonorrhœa and secondary syphilis, Mr. Acton admits, may be excluded from consideration in this respect. The plea, that women affected with syphilis frequently still continue to prostitute themselves because there is no hospital where they can receive care, and that they thus endanger the public health, is one which cannot be admitted here. If women diseased will not seek the means of cure which are open to them now, it is very probable that neither would they do so if an hospital were specially opened to receive them. And, as Mr. Acton well knows, the condition of primary syphilis which is most likely to propagate the disease, is just the condition which occasions the least inconvenience or pain in the woman, and therefore that for which she is the least likely to seek relief. Women, indeed, not unfrequently communicate the disease to man, without being aware that they themselves are the subject of it. Hence, therefore, to arrive at the special object which Mr. Acton has in view in extending hospital accommodation for venereal diseases—viz., protecting the public health, nothing less than the regularly enforced examination of prostitutes by speculum would be of avail—a practice, as we have seen, utterly impracticable in this country.

Mr. Acton's other scheme for the sanitary regulation of prostitution is the formation by prostitutes of a benefit club—a "London Female Sanitary Society." This is to be supported by charitable contributions, and by weekly payments made by prostitutes when in health. Members, when diseased, are thereby to be entitled to medical attendance, and "an allowance while under treatment." This scheme, like the other sanitary schemes of Mr. Acton's hatching, has also the fatality of impracticability suspended over it. What body of gentlemen would he find to undertake the management of such a concern—the collecting of such a sort of money? Who would patronize the proceeding? Why should prostitutes, when unable to follow out their vocation, be especially singled out among the needy classes for such marked attention? Medical men are to be, of course, the chief agents in carrying out the work; they are to insinuate themselves into the good graces of these people; they are to be almoners as well as physicians—bring money in one hand and healing in the other. They are to volunteer advice to those in health—to instruct them how to carry out their trade with least danger to themselves.

> "One of their most important doctrines in connexion with the Society, would be the inculcation of prophylactics upon women in health, to whom, under the circumstances I have imagined, he would have easy access.
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> "The use of soap and water after connexion should be insisted upon, and micturition at the same time. The female should be cautioned against too frequent sexual congress, whether in obedience to instincts of her own, or in compliance with male lasciviousness.

At length, after a few such preliminary lessons, the prostitute "may be delicately told," that interior examinations lead to early discoveries, and that venereal sores, if treated at once, "have no more than transiently unpleasant results." She must daily use an injection, "one ounce of chlorinated soda to one pint of water," and by the aid of "a proper elastic syringe, the ordinary pewter ones being of little use." Such is the style of instruction which Mr. Acton would have imparted to the pupils by his sanitary doctor. Whoever desires to become more fully acquainted with the precautionary and other measures prescribed by Mr. Acton, must consult his book. It is by delicate attentions of this kind, bestowed upon the bodies of prostitutes, that the medical attendant is to gain influence over their minds; and through this influence Mr. Acton sees his way to a redemption of them back into the paths of virtue.

Now, for ourselves, we will take the chance of being called narrow-minded and prudish, by unhesitatingly condemning such schemes, and on the ground that they are repugnant to moral sense. They bring, indeed, their condemnation with them.

If Mr. Acton's principles are correct, indeed, we are bound at once to open a course of public instruction, for the express purpose of teaching prostitutes and their paramours how best, according to the rules of high science, they may be enabled to elude the possible penalties of disease which attend upon illicit connexion! and for the sake of public hygiene, such instruction should be widely given, and under the patronage of Government, and all the prostitutes of London should be invited to attend them! In our view, all that we have said concerning the immoral effects attached to the Government patronage of prostitution, applies exactly in this matter also, and therefore condemns it. We need not trouble the reader by recurring to them here.

Such, then, are the general facts connected with the history of prostitution which we have to lay before the medical world; and such the conclusions, affecting the management and regulation of the social disorder and the bodily diseases (its constant associates), to which we think reason or common sense leads the inquirer.

We differ completely, it will be seen, from those who call upon the Government to attempt by any special acts to regulate or repress prostitution. But, at the same time, we would gladly see the hand of the police pressed more firmly on the many promoters, direct and indirect, of disorders associated with the vice; for these public displays are manifestly seriously injurious to the morals of the people.

The grand battle, however, with prostitution must, we are convinced, be fought in the heart of man himself; there alone can the labour of regeneration be worked out. Instruct the young better to regulate their passions. Bring men to a true knowledge of what the thing called prostitution really is. Learn them to judge it as a crime, and to shun it as dishonour. Strive to assuage all those many miseries of society which drive the wretched into crime. Struggle against the unrighteous fallacies forced by fashion upon the world around us. Thrust the seducer from decent life, as you would expel the slave-dealer from your home. Set the brand of society's scorn upon him. Here is the field of labour, and herein every one of us may work successfully; and these and such like are the lessons, in the teaching of which our profession can act well the instructor's part; and so lead society to struggle successfully against this pernicious enemy of the souls and bodies of mankind.

REVIEW IX.

1. *Lehrbuch der Geburtshilfe.* Von Dr. FRIEDRICH W. SCANZONI, Professor der Geburtshilfe, &c., zu Würzburg. Dritte Auflage.—*Wien*, 1855. pp. 1066.

Manual of Obstetrics. By Dr. F. W. SCANZONI, Professor of Obstetrics, &c., University of Würzburg. Third Edition.—*Vienna*, 1855.

2. *Lehrbuch der Krankheiten der Weiblichen Sexualorgane.* Von SCANZONI.—*Wien*, 1857. pp. 570.

On the Diseases of the Female Generative Organs. By Dr. F. W. SCANZONI.—*Vienna*, 1857.

THE works before us from the pen of the accomplished Professor of Würzburg bear testimony to the zeal, industry, and ability with which he has cultivated the science of obstetrics and the allied branches of medical knowledge—industry, one reward of which at least he is now reaping in a widely-extended name and reputation.

The first—the 'Manual of Obstetrics'—is a goodly volume of 1066 pages, well illustrated with woodcuts, and in which the various subjects are handled in a masterly, complete, and systematic manner, albeit with a manifestation of that love of division and subdivision so characteristic of German writers, and which to English readers occasionally appears carried to an extreme. The work is an almost exhaustive exposition of the present state of the science of which it treats; and in it the student and practitioner will find a mass of knowledge collected, any part of which, from the mode of arrangement adopted, is easily accessible. As a text-book for students, its length would be perhaps, in this country, considered as an objection, unduly addicted as we are to treatises of a more concise and synoptical character.

All systematic works on midwifery have a certain and necessary amount of resemblance to each other, owing to the fact that the great principles of the science may be said to be firmly established, and that on minor points alone, though this is not universally the case, differences of opinion exist. It would therefore serve no useful purpose, even if our space admitted of it, to systematically analyse at any length the treatise before us, and we shall limit ourselves to a reference to a few only of the points which, for various reasons, appear most deserving of consideration.

The great divisions of the work are the following:—Anatomical Description of the Pelvis and Female Generative Organs; Physiology of Pregnancy, and Outline of the History of Human Generation and Development; Physiology of Parturition; Physiology of Child-bed; Pathology of Pregnancy; Pathology of Parturition; Obstetric Operations; Chief Diseases of Puerperal Females and New-born Infants.

Respecting the occurrence of menstruation in females advanced in life, Scanzoni agrees with Kiwisch, that after the age of fifty-five, hæmorrhages from the uterus lose their significance as outward signs of the periodic maturation of ova, and that the power of conception no longer remains in such cases. In common with all recent observers, he holds the idea that menstruation is the outward sign of the periodic ripening of the ovum.

Most of our readers are doubtless acquainted with Dr. Simpson's elaborate memoir 'On the Attitudes and Positions of the Fœtus in Utero.' In connexion with this subject the following remarks of Scanzoni on the position usually assumed by the fœtus, and on the circumstances which give rise to it, are therefore interesting:

> "In the first six months of pregnancy the enlargement of the uterus is effected at the expense of the fundus. . . . About the middle of the seventh month the enlargement of the lower division of the uterus commences, whereby the cavity assumes a more oval form, and the measurements at its upper and lower circumference are pretty nearly equal. As is well known, and as we have had frequent opportunities in cases of abortion of convincing ourselves, the fœtus occupies a nearly horizontal position during the first weeks of its existence. . . . As it increases now in length, the transverse diameter of the uterine cavity being less, no longer affords it the necessary room, and the fœtus gradually becoming more firm, and presenting a greater resistance, is, so to speak, constrained by its increase in size to bring its long axis into that of the uterus, whereby one or other extremity of the trunk is elevated towards the fundus uteri. The lower division of the uterus is not yet, however, sufficiently large for the disproportionately voluminous head of the fœtus. Thus it happens that the latter, partly perhaps owing to active movements of the fœtus, is elevated into the widest part of the uterus corresponding to the fundus, but the pelvic extremity occupies the deepest part—the cervical portion of the cavity." (p. 91.)

In six years, 12,539 deliveries took place in the Prague lying-in institution; of these, 21 occurred before the seventh month, and of these, 15 were cases of pelvic, and only 6 of cranial presentation. In 24 other cases of abortion observed by Scanzoni in private practice, 14 were cases of pelvic presentation. In premature births at a later period of pregnancy, pelvic presentations were often observed, and in cases where the fœtus was born dead this presentation more especially occurred. The conjoint experience of Scanzoni and

Dubois on this interesting point is thus expressed: The per-centage of cranial presentations where the child was less than six months old was 48·7; after the sixth month the per-centage of cranial presentations was, of children born dead 59·6, of children born alive 80·8.

> "Hence, in premature births, in the earlier months of pregnancy the fœtus lies with its pelvic extremity directed downwards disproportionately often; and the frequency of this position diminishes as the proper period of pregnancy approaches its termination. Further, it is remarkable that cranial presentations so frequently occur in those pregnancies in which the child is born alive." (p. 93.)

The head assumes the lower position at a later period, because the lower segment of the uterus becomes more developed at that time. The upper part of the body of the fœtus becoming heavier than the lower, tends to fall to the lower situation, and the more so as the narrow pelvis of the fœtus is not a firm basis of support for it. As a natural consequence, the fœtus turns, and assumes the position with the head downwards (p. 93).

The conclusions of Scanzoni as to the usual position of the fœtus at different periods of intra-uterine life, are in most respects identical with those of Dr. Simpson, but the cause of the final assumption of the vertical position with the head presenting is, according to Scanzoni, the shape of the uterus, one paragraph alone leading us to infer that he would be disposed to admit the influence of the movements of the fœtus itself in producing this result. Dr. Simpson, in the paper alluded to, considers that the motions of the fœtus, consisting of strong and well-marked reflex movements and actions performed during intra-uterine life by the motor muscles of the trunk, and particularly of the limbs of the fœtus, are the chief cause of the position in question; and, according to the same authority, the position thus assumed is maintained by the same means, any disturbance of this natural position exciting reflex movements in the fœtus, by which it is speedily restored.

The signs of pregnancy, and the differential diagnosis of this condition, are well treated of; and a useful table is given, illustrating the diagnostic value of the several data at different periods of pregnancy. A ready method of determining the date of delivery, which appears to be used by German obstetricians, and which is applicable in most cases, deserves notice. The date of the last menstruation being given, count three months backwards and add seven days; this will give the day on which the delivery may be expected to occur.

In reference to the respective influence of the cerebro-spinal and of the sympathetic nervous systems on the movements of the uterus in parturition, Scanzoni believes that both of these systems of nerves have a share in the production of the movements in question, but he regards it as more than probable that, notwithstanding the distribution of motor fibres from the cerebro-spinal system in the uterine substance, the contractions of this organ are regulated by the sympathetic system. Wigand's views as to the order in which the different parts of the uterus contract during a pain, he considers to be incorrect, the contraction of the whole organ being simultaneous, and not, as Wigand believed, commencing below.

In the chapter devoted to the mechanism of parturition, the several positions and presentations are fully discussed, and the causes of the different abnormal positions of the fœtus pointed out, together with the means of recognising them by internal and external examination. In cases of cross presentation, Scanzoni has always found the uterine tissue unduly relaxed, and this relaxation is, in his opinion, the most important of the causes leading to this mode of presentation.

The involution of the uterus after delivery is described as taking place under normal conditions as follows: Immediately after the expulsion of the placenta the contraction of the uterus is extreme, the upper surface of the organ only reaching four inches above the pubis, but during the next two hours the uterus gradually enlarges, and at the end of this time extends six or eight inches above the pubis. The progressive, true involution of the uterus does not begin until after the expiration of twenty-four or thirty-six hours. We regard the period at which this occurs as exceedingly important in reference to the possible absorption of deleterious matters by the uterine veins from the internal surface of the uterus, it being evident that when the involution is postponed until after diseased actions have been set up within the uterus, the products of such morbid action will more readily, under such conditions, pass into the veins, and give rise to one of the forms of puerperal fever; in confirmation of this supposition, it is interesting to find that Scanzoni observes in another place that deficient involution of the uterus appears to predispose to attacks of this disease.

Under the head Pathology of Parturition, we find a large share of attention devoted to the abnormities of the pelvis, and their influence in retarding or impeding the act of birth; and the diagnosis of these various anomalies, by external and internal examination, is dwelt on at considerable length. On the much-contested question, as to the effect of the administration of ergot on the life of the child in cases where the expulsive efforts of the uterus are deficient, Scanzoni remarks that in several cases he has observed the sounds of the fœtal heart to diminish in force and frequency ten or fifteen minutes after the drug has been administered, and in such cases, even where the delivery was artificially hastened, the child was born dead. He is inclined to attribute the noxious agency of ergot on the child to the forcible and continuous contractions of the uterus thereby induced; and adds, that it should not be given in cases where the delivery of the child is likely to be long postponed.

Puerperal convulsions are most frequently excited by irritation of the peripheric spinal sensory nerves, but they may be induced, according to our author, by direct irritation of the spinal nervous centres (*Rückenmarks-convulsionen*), or by irritation conveyed from the brain to the medulla (*Gehirn-convulsionen*); one of the most powerful "*Causal momente*" of the convulsions is considered to be the condition of the blood induced by Bright's disease. Puerperal convulsions occurred in 190 cases out of 91,272—i.e., in the proportion of 1·480. Of 30 cases under Scanzoni's own observation, 25 were in primiparæ.

The next division of the work, treating of "Obstetric operations," comprises almost all that is to be said on the subject. The plan adopted, of separating the description of the operations themselves from the consideration of the conditions for the relief of which they are required, is in many respects disadvantageous. The operations are discussed under two heads: 1. Those which are of a "preparatory" character; and 2. Those by means of which either the whole act of parturition, or single parts of it, are artificially brought to a termination. Under the first head are comprehended the artificial dilatation of the os uteri, the enlargement of the os externum by scarification, artificial rupture of the membranes, the induction of abortion, and of premature labour, and turning. Under the second head, 1. Operations which only aim at delivery without necessarily injuring the fœtus, including the use of the forceps, manual efforts, the vectis, air tractors, &c.; 2. Operations in which injury is necessarily inflicted on the child, perforation, embryotomy, &c.; 3. Operations in which parts of the mother are injured in order to afford an artificial mode of egress for the child, including the Cæsarean section; 4. Artificial detachment and extraction of the placenta; 5. The *accouchement forcé*.

The operation of turning by the head has been, Scanzoni considers, too much neglected; and he believes that in many cases this operation might be performed instead of that usually adopted of bringing down the feet, and that the lives of many children might be thus saved. Turning on the head is only to be performed, he remarks, 1. When the body of the fœtus is so moveable that its position can be altered without the exercise of any considerable force, and without danger of injury to the maternal organs. This mobility can only be calculated on when the liquor amnii has either not at all, or only partly and recently escaped, when the uterus is not found generally or partially contracted, and the presenting part of the fœtus has not yet entered the pelvic brim. 2. When the head is tolerably near the os uteri; 3. When good and effective contraction of the uterus can be calculated on, so as to retain the head in its new position; 4. When the pelvis is tolerably wide. The operation is not advisable when the immediate extraction of the child by the forceps may be necessary, owing to the difficulty of fixing the head so as to allow of the use of these instruments. In most cases, from the fact that the patient is seen too late, Scanzoni admits that the operation of turning by the feet is the only one admissible.

The second of the works before us, 'On the Diseases of the Female Generative Organs,' extends to 570 pages. It is divided into seven sections, in which are respectively treated,—the Diseases of the Uterus, of the Uterine Ligaments and Coverings, of the Fallopian Tubes, of the Ovaries, of the Vagina, of the external Genitals, and of the Breasts. The most important of these are those appropriated to the consideration of the diseases of the uterus and ovaries, and to a notice of these the following remarks will be restricted.

Flexions of the Uterus.—On this subject we have some very interesting and important observations. Scanzoni finds, on careful examination, that the cervix, and that part of the uterus in the immediate neighbourhood of the seat of the flexion, is generally flattened, the uterine tissue less resistant and firm than usual, and especially on that side towards which the organ is flexed. The portions of the uterus so altered are described as having a yellowish colour, which on microscopic examination is shown to be due to the fact that the proper uterine tissue has undergone fatty transformation. The situation of the flexion, generally combined with ante- or retro-flexion of the organ, is usually just above the cervix; in two cases atresia of the uterine canal existed at the seat of flexion.

The greatest number of cases of flexion of the uterus presented themselves between the ages of thirty and thirty-five, and the chief of the causes which tend to its production Scanzoni considers to be,—too early marriages, followed by conception in cases where the sexual organs are yet imperfectly developed, pregnancies rapidly succeeding one on the other, and premature labour and abortion. The latter cause is especially operative in the production of flexions of the uterus amongst the lower classes of society, household or other occupations being with them often resumed at too early a period after the premature expulsion of the contents of the uterus, and before the organ has undergone the necessary involution. Our author further believes that this involution always takes place less rapidly in cases of premature delivery than when the pregnancy has extended over the proper period. Women who do not suckle their infants are also said to be more liable to flexions of the uterus after delivery, than those who do not so neglect their maternal duties, a reason for which is to be found in the effect of the irritation of the nipple during the act of sucking on the contractions of the uterus. Flexions of the uterus are, in a few cases, more productive of further results of importance; but when the lesion has reached a certain point, anomalies of the uterine texture and of the mucous membrane necessarily result. The uterine vessels become enlarged, the organ congested, and the circulation of the blood impeded in consequence of the pressure exercised; increased secretion from the mucous membrane of the uterus, erosions and ulcers of various parts of the cervix and os uteri, and a certain amount of hypertrophy of the uterus, are also results of the lesion in question.

Scanzoni decidedly disapproves of the mechanical treatment of flexions of the uterus by the introduction of instruments into its cavity and their retention there. He says: "We hold their employment to be dangerous, useless, and moreover, in consequence of inseparable concomitant circumstances, in many cases inadmissible and impracticable." (p. 93.)

Scanzoni further states that he has had an opportunity of observing the state of the uterus in several cases of flexion which had formerly been under the care of Kiwisch, and in which the instruments in question had been used. The state of the uterus discovered was such as to convince him that no good had been effected by their employment. Much more benefit is to be derived from a mode of treatment directed to the removal of the textural changes of the uterus usually present. If the flexion be of recent date, and dependent on simple relaxation of the uterus, the cold douche, cold hip-baths, and vaginal injections consisting of infusion of ergot, twice or thrice a week, are recommended; and when very profuse cervical blennorrhœa is present, cauterization of the cervical canal by nitrate of silver. Leeches are to be applied to the cervix every eight or fourteen days in cases in which there is abundant hæmorrhage, the venous stasis being thereby much diminished, and the tendency to serous infiltration of the body of the uterus mitigated. Scanzoni finds the obstinate constipation often attendant on cases of this kind very easily and simply obviated, by directing the patient to wear a bandage round the pelvis, between which and the hypogastric region of the abdomen is placed a pad or cushion. The pressure of the pad is said to prevent accumulation of fæces in the lower part of the intestinal canal, and to be moreover occasionally effectual in removing the flexion itself.

Of 114 cases of prolapsus and procidentia uteri treated by Scanzoni, 99 occurred in women who had given birth to children. For the relief of simple cases of this kind he recommends the sponge pessary, alum, tannic and muriate of iron injections. The pessary of Zwanck, consisting of two oval flat perforated pieces, connected by a hinge-joint, which, after being introduced into the vagina, are separated and maintained in this position by a simple contrivance, he finds useful in many cases. The instrument is simple, easily removed and introduced, and we think its more extended introduction into this country might be attended with advantage. Another form of uterine support, the air-pessary of Jariel, is favourably spoken of in cases where the vaginal walls are much relaxed and extended.

Respecting the operative procedures for the cure of this condition, Scanzoni has performed that of removal of a portion of the mucous membrane of the vagina, in order to produce narrowing of this canal, in 13 cases; and that of narrowing the vaginal orifice in 5 cases. He expresses himself, however, as "by no means satisfied with the results obtained."

Of the "chronic infarctus," or "chronic parenchymatous inflammation of the uterus," we receive a very complete account. The uterus so affected is enlarged, the uterine wall at the fundus sometimes measuring as much as an inch in thickness. The whole organ is also remarkably hard and firm, its tissue very resistant, dry, and anæmic; but in parts the vessels are much enlarged and full of blood, the latter hyperæmic condition being more often present in cases of fibrous tumour or polypi of the uterus. The anatomical change which takes place in the uterine tissue is said to be a great increase in the amount of connective tissue. The complications of this condition of the uterus are—varicose enlargements of the veins in the neighbouring organs; chronic catarrh of the vagina, bladder, and rectum; peritoneal adhesions of the uterus, and chronic hyperæmia; and formation of cysts in the ovaries. The effect produced on the menstrual function is generally to diminish the quantity of the discharge, and in many cases to give rise to dysmenorrhœa. The chronic hyperæmia of the uterine mucous membrane often leads to the formation of an exudation on its surface, which is discharged at intervals and with great pain in the shape of small membranous shreds. The chief causes of chronic infarctus are, according to the author, acute metritis; any circumstance leading to irritation and congestion of the uterus; displacements of the organ, &c. Its origin is frequently to be traced to deficient puerperal involution of the uterus, abortion, and excessive sexual intercourse. The unfruitfulness of prostitutes he considers to be connected with the existence of this uterine hypertrophy.

On the subject of Diagnosis, Scanzoni's observations are always good. There is occasionally, he remarks, a difficulty in diagnosticating between chronic infarctus and fibroid tumours or polypi. The state of the catamenial function will afford useful information, for in chronic infarctus the discharge is,

> "As a rule, small in quantity, but in cases of sub-mucous fibroid and polypi nearly always very profuse, and occurring unusually often. Larger, sub-peritoneal fibroid tumours of the uterus are recognised by palpation, as more or less clearly limited, round, uneven elevations; and, in the case of an intra-uterine polypus, or a sub-mucous fibroid tumour which has attained a volume somewhat more considerable, the length of the cervix is markedly diminished, the cervix has sometimes actually disappeared, in consequence of the spreading out of the cervical cavity; whilst in simple infarctus the cervix is found nearly always unusually enlarged, and its walls thickened."

The treatment found most successful in cases of chronic infarctus is the following:—At first, leeches to the cervix every five or six days, warm hip-baths, and injections, consisting of water alone, or of solutions of salts of iodine and bromine. Internally, the use of the mineral waters of Marienbad, Kissingen, Karlsbad, Ems, &c.; and in cases where they are indicated, the preparations of iron.

The "fibrous tumours" of the uterus are classed according as they are situated within the tissue of the uterus ("round fibroid tumour"), or in the cavity of the organ ("uterine polypi").

The "round fibroid" tumours vary in size, from a barleycorn to twice the size of a man's head, and they are chiefly situated at or near the fundus. For practical reasons, Scanzoni distinguishes them into "sub-peritoneal," "interstitial," and "sub-mucous." The diagnosis of each of these forms is given with great precision. The interstitial variety, inasmuch as it generally attains a larger size than the others, and gives rise to more profuse hæmorrhage, is regarded as the most unfavourable to the patient. Iodine taken internally, and applied externally, Scanzoni appears to have most faith in as a remedial agent; but he speaks rather discouragingly of the results obtainable, so far as a complete cure of the disease is concerned. He does "not remember a single instance in which, by the use of these or any other means, a perfect removal of the fibroid tumours was effected." The symptoms produced may be very much relieved, and even removed, by treatment, but the improvement is to be attributed to the removal, or diminution of the intensity of, the secondary alteration produced by the tumour, hypertrophy of the uterus in particular. He speaks favourably of the effect of an ointment introduced into the uterine cavity, composed of iodide of potassium and mercurial ointment, a combination recommended first by our countryman, Dr. Rigby.

After a description of "fibrous polypus" of the uterus, follows an inquiry into the comparative merits of the three methods of treatment usually recommended for the removal of these bodies—by the ligature, excision, and torsion. The same operation is considered not to be admissible in all cases. Scanzoni rejects the ligature in most cases, owing to the unfavourable and occasionally dangerous symptoms liable to be produced. Of 31 cases operated on by him, he had only used the ligature three times, and in these three cases either torsion was impracticable, owing to the thickness of the pedicle, or excision impossible, owing to the high attachment of the polypus. Torsion was adopted in 10 cases: in these cases it was not possible to introduce the scissors sufficiently far to cut across the pedicle, and the fact that the diameter of the pedicle was small enough to allow of the tumour being twisted off had been ascertained. Scanzoni arrives at the knowledge of the fact in question by seizing the polypus and endeavouring to impart to it a rotatory motion; if the rotation is easily effected, the neck of the polypus is considered to be so thin as to allow of its removal by the method of torsion. The long narrow-bladed scissors are the instruments recommended for the excision of these uterine polypi.

Passing over the disorders of menstruation, a subject discussed in a very philosophical manner, we come to the affections of the ovaries.

Ovarian tumours are divided into two classes, consisting of hollow and solid tumours. In the first are included, simple cyst-formations, compound or multilocular cysts, cystic sarcoma, colloid tumours, and cysto-carcinoma. The solid tumours of the ovaries include fibroid tumours, of which Scanzoni has observed 4 cases; enchondroma, and cancer, the latter being, as a rule, a secondary affection.

Of 1823 women observed by our author in his gynæcological practice, 97 were affected with ovarian disease. Of 41 cases in which the nature of the disease was established by post-mortem investigation, simple follicular dropsy was found in 14 cases; compound cystic disease in 12; colloid tumours in 9; cystic sarcoma in 5; and cysto-carcinoma in 2 cases. In 14 cases the right, in 13 the left, and in 14 cases both ovaries were affected. Lee's, Chéreau's, and Scanzoni's cases together are 349 in number, and in these the right ovary was the seat of the disease 173 times, the left 126, and both ovaries 50 times.

The general conclusions as to the ætiology of ovarian diseases are thus expressed:—They, with few exceptions, only become developed during that period of life in which the generative organs are in a state of activity. Abstinence from sexual intercourse, especially when combined with menstrual irregularity, and long-continued and intense hyperæmia of the ovaries, from whatever cause, are the most frequent causes of these affections.

The important and much-debated question as to the proper treatment of ovarian dropsy, the reader will find comprehensively and judiciously handled. The "operations" for the cure or relief of this affection are the following:—Puncture of ovarian cysts through the anterior wall of the abdomen; puncture through the wall of the vagina; injections of irritating fluids into the cavity of the cyst; excision of a portion of the cyst wall; extirpation of the whole tumour.

Scanzoni regards the first of these operations to be generally unsuccessful as a curative method, while it is not always free from danger. The second, that of puncture of the cyst through the wall of the vagina, is spoken much more favourably of, as affording a chance of permanent relief. Of 14 cases operated on by the latter method, 8 were cured. In 2 cases the cyst began to fill again a few weeks after. In 3 cases the result was unknown, the patients having escaped observation, and 1 died subsequently of typhus. In this operation, the results of which are thus so encouraging, and which is of course only admissible in those cases in which the cyst has not risen from the cavity of the pelvis, the cyst is punctured, and the fluid afterwards allowed to drain off through a tube which is retained in the cyst for some few days. Injection of the cyst, Scanzoni considers to be hazardous, on the ground that it is always impossible to predicate the amount of inflammation which may be excited thereby; and excision of a portion of the cyst wall as still more so, from the severe hæmorrhages and inflammations likely to occur. The operation of extirpation of the tumour he characterizes as simply a surgical venture (*chirurgisches Wagestück*). Of 11 cases operated on by Kiwisch and Langenbeck, he reports 9 as having terminated fatally.

In conclusion, we have only to say that we have derived much instruction from the perusal of the work, and we can confidently recommend it to those engaged in the investigation and treatment of the diseases of the female generative organs, as a sound, practical, and useful treatise.

REVIEW X.

Report of the Commissioners appointed to inquire into the Regulations affecting the Sanitary Condition of the Army, the Organization of Military Hospitals, and the Treatment of the Sick and Wounded; with Evidence and Appendix. Presented to both Houses of Parliament by command of her Majesty.—*London*, 1858. Folio.

In the spring of 1856, after the tale of the sufferings of our gallant troops in the Crimea had been substantiated by undoubted evidence, the House of Commons, on the motion of the late Mr. A. Stafford, appointed a Select Committee on the Medical Department of the Army. The object of this Committee was apparently (for, as there were no instructions given to it, this can only be conjectured from the general tenor of its examinations) to trace out the causes of those practical defects in the working of the department which had become manifest in the early part of the Crimean war; to inquire into the acknowledged and alleged grievances of the medical officers; to suggest such alterations in the mode of their admission, promotion, and retirement, and in the system of government of the department, as should seem best calculated to raise it to a high state of efficiency; and to make such recommendations on the organization of military hospitals as would be likely to prevent a recurrence of the disastrous mismanagement which had unfortunately been the characteristic of the general hospitals at Scutari in the winter of 1854–5. In due time the Committee made its Report, which, with the evidence and Appendix, was printed in the form of a Blue Book. Rumours were then current of a Royal warrant, founded on its recommendations, which was greatly to ameliorate the condition of the medical department; but no such document appeared. On the re-assembling of Parliament in 1857, in reply to a question by Mr. Stafford, whose exertions on behalf of the sick soldier merit the highest praise, Mr. F. Peel stated that it was the intention of her Majesty's Government to appoint a Royal Commission to inquire into the subject. This decision was probably come to from the feeling that a Committee of the House of Commons, on which there was not a single medical officer, nor indeed any member practically acquainted with the subjects under inquiry, was likely enough to commit some serious mistake, or to make some impracticable recommendation. The members were, certainly, much at the mercy of private advisers, who were not unlikely to direct attention to points personally interesting to themselves, and to neglect the weightier interests of the sick soldier and of the medical department generally.

In announcing the intention of the Government, the Under-Secretary of State for War

> "Would not deny that the advantages offered in other services had the effect of preventing the most able men from competing for employment in the Army Medical Department; and he was anxious that the medical officers of the army should possess at least equal advantages with those enjoyed by the same class of persons in other services. He confidently believed that the recommendations of that Commission, coupled with the resolutions of the Committee of last session, would enable the Government to deal with this question in a manner which would be satisfactory to the medical officers and beneficial to the service."*

Accordingly, in May last a Royal Commission was issued to the Right Honourable Sidney Herbert, who had formerly been Secretary at War; Mr. Augustus Stafford, who had personal experience of the hospitals in the East, and had obtained during the previous inquiry much knowledge of the state of the department, and the feeling of its members; Colonel Sir H. Storks, the military commandant of the hospital at Smyrna, and subsequently at those of Scutari, and now holding an appointment as military secretary in the war department; Dr. A. Smith, director-general of the army medical department; Mr. Alexander, inspector-general of hospitals, who had served through the whole of the late war, both in Bulgaria and the Crimea; Sir T. Phillips,

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* Hansard's Debates, vol. cxliv.

Sir Jas. Clark, Mr. J. R. Martin, and Dr. J. Sutherland, one of the sanitary commissioners sent to the Crimea in 1855, directing them "to inquire into the organisation, government, and direction of the medical department of the army." Dr. Balfour, who is well known as one of the authors of the Army Statistical Reports, was appointed secretary. It would indeed be difficult to find a body of men who, from their general acquirements, their habits and previous pursuits, and their independent position, would be more likely to conduct a searching inquiry into such a matter honestly and impartially, or to declare their opinions fearlessly, and offer valuable practical suggestions. Nor have we been disappointed in our expectations. The Report is clear, temperate, and practical, and the inquiry bears marks throughout of having been conducted with a view to ascertain defects and to suggest remedies—not to throw blame upon individuals, or to ascertain, in popular phrase, "whom we should hang."

The instructions issued to the Commission were of a very general character, and admitted of considerable latitude in their inquiries. Their first step, therefore, was the very judicious one of classifying the various matters, and defining more strictly what they conceived to be the limits of their investigation. Referring our readers to the Report for the details of this classification, we may briefly sum them up as being—the powers vested in the medical department, and the measures in force for the prevention of disease in the army, the means provided for its cure, the system of recording and registering it, the course adopted in invaliding soldiers, the position of the army medical department in everything relating to the individual officers, and the constitution and organization of the government of the department.

But the Commissioners judiciously observe:

> "Before entering upon any consideration of the measures heretofore taken, or those which should in future be taken, to secure the health of the troops, whether in peace or war, the sufficiency or insufficiency of the former should be tested by the results produced. If the troops be habitually in the enjoyment of as good health as the rest of your Majesty's subjects, a state of things so satisfactory would seem to preclude the necessity of any further inquiry into the subject."

With a view to ascertain this, the Commission examined Dr. Farr, of the Registrar-General's Department; Mr. Neison, an actuary, who has paid much attention to the subject of Friendly Societies; and Colonel Sir A. Tulloch, and have given at some length the results of their inquiries.

The soldier may be considered as a selected life. Previous to admission into the army, every recruit is examined by a medical officer; and at this ordeal, as shown by a series of returns in the Appendix, extending over twenty years, one-third of all the men inspected are refused; and of these, between one-fourth and one-third for causes which would be likely to shorten life. It is remarkable, that while the proportion of rejections, for medical reasons, in the British army, on the average of twenty years (1832–51), amounted to 318, in the French army, on the average of thirteen years (1831–43), it was 324 per thousand. (Appendix, lxvi.)

But there is another operation by which the mortality in the army should be diminished. When a soldier becomes inefficient, from his health breaking down, or from any cause which disables him for military service, he is discharged as an invalid; and, by this process, from one and a half to two per cent. of the troops serving in the United Kingdom are got rid of annually, before the period arrives at which they might be deemed *emeriti*. An army, the admission into which is guarded by such precautions, and from the ranks of which sickly and inefficient men are thus eliminated, might naturally be expected to be more healthy than the general population, This, however, is far from being the case, as will be seen by the following summary of the results stated in the Report:

Ratio of Deaths per 1000 *living at Army Ages*—20–40.

Household Cavalry*	11·1
Cavalry of the Line*	13·5
Infantry of the Line*	17·8
Foot Guards*	20·4
Male population of England and Wales†	9·2
Country population†	7·7
Manchester†	12·4
Twenty-four large towns where troops are usually quartered*	11·9
Agricultural labourers, members of Friendly Societies‡	6·05
Agricultural labourers generally‡	8·00
Outdoor trades in towns‡	8·54
Partially outdoor trades in ditto‡	8·45
Printers‡	9·09
Police‡	8·92
Miners‡	10·31

We look with some suspicion on the very low rate of mortality of agricultural labourers, members of friendly societies, as stated by Mr. Neison, because we are aware that there are considerable sources of error in the returns of these societies which it is extremely difficult to rectify. But, taking the other occupations, or the general population, there is enough to excite surprise and to call for searching inquiry, in the fact that the mortality in the infantry of the line is one-half greater, and in the Foot Guards nearly double that of the population of large towns.

The Commissioners having thus shown the necessity for further investigation, proceed to inquire into the causes of this high rate of mortality. They state the causes assigned to them to be:

> "1. Night duty. 2. Want of exercise, and suitable employment. 3. Intemperate and debauched habits among soldiers. 4. Crowding and insufficient ventilation, and nuisances arising from latrines and defective sewerage in barracks." (p. 13.)

To the first of these they are "disposed to attach little comparative importauce," seeing that the mortality of the police, who do more of that duty than troops, is only one-half as high. It is very difficult to say how much of the mortality is produced by this cause. The Commissioners have, however, supplied in the Appendix some returns which may assist in solving the question. The City police force is divided into a day and night police, which are kept quite distinct. The day force is divided into two relays, and does duty from 6 A.M. till 10 P.M.; the night force is on duty every night from 10 P.M. till 6 A.M. On the average of five years, the mortality in the night force exceeded that in the day force by 4 per 1000. The numbers are too small to warrant any very positive deductions, but the results are sufficient to justify the conclusion that night duty does not account for the excessive mortality in the army; and it must not be forgotten that, while the police are on duty every night, the soldier mounts guard only once in four or five nights.

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* Army Statistical Report. 1853. † Dr. Farr. ‡ Mr. Neison.

To the want of suitable exercise and employment the Commissioners seem to attach considerable importance, and refer in support of this view to Mr. Neison's tables. We are not prepared to attribute much of the mortality to this cause, but in a moral point of view the importance of the subject cannot be overrated. A large proportion of the crime and dissipation in the army is doubtless owing to the want of some rational occupation; *ennui* drives the men to the grog-shop, and they become drunkards for want of something to do. On this point we earnestly trust the recommendations of the Commissioners will meet with due attention from the military authorities.

The third cause is that of the intemperate and debauched habits among the soldiers. On the subject of intemperance the Commissioners remark, that there is no evidence to show that the soldier is more drunken than the average of the class from which he is taken. On the contrary, there is reason to suppose that, from the smallness of the balance of pay which comes into his hands, and the vigilant discipline exercised over him, he has fewer opportunities of drinking to intoxication than the labouring classes in general. But, even were this not so, we do not think that intemperance would add much to the mortality in the ranks of the army. It would probably tend to increase materially the amount of invaliding; but it is not till later in life—till after the age at which a soldier is usually discharged to pension—that it swells the list of deaths. Mr. Neison propounded a theory, that diseases of the "nervous system," and of "the digestive organs," may be

> "Regarded as the distinctive type of the causes of death among intemperate persons; and the predominance of deaths assigned to such causes in any particular collection of facts may fairly lead to the inference of irregularity of habits having prevailed to an unusual extent."

The Commissioners observe that they "are unable to adopt the conclusions at which Mr. Neison has arrived;" a decision in which we fully concur. We may observe, that if his theory be correct, the soldiers of the Life Guards must be more irregular in their habits than any other branch of the service, and nearly twice as intemperate as the Foot Guards—a question which we may safely leave to be decided by our London readers. It would require much more extensive data, and more accurate observation, to justify the adoption of such an hypothesis.

With regard to sexual debauchery, with its very frequent concomitant venereal disease, we believe it to have been under-rated as a cause of disease. Frequent attacks of syphilis break down the constitution, and produce that cachectic condition which favours the development of phthisis. Syphilis prevails to a considerable extent among soldiers, and as it often happens that the same man contracts the disease several times in quick succession, it is very likely under such circumstances to break down his constitution. On this point, however, we are not aware of any special observations having been made, but we trust it will now attract the attention of the army medical officers, and lead to some accurate scientific investigations into the subject.

But the fourth of the causes assigned, "crowding and insufficient ventilation, and nuisances arising from latrines and defective sewerage in barracks," is that to which the Commissioners attach the most importance. The difference in the mortality of soldiers and civilians arises chiefly from pulmonary affections. It is stated that—

> "While in civil life at the soldiers' ages, the deaths by pulmonary diseases are 6·3 per 1000; they amount in the cavalry to 7·3, in the infantry of the line to 10·2, in the Guards to 13·8 per 1000; and that of the entire number of deaths from all causes in the army, diseases of the lungs constitute the following proportions; namely—in the cavalry 53·9 per cent.; in the infantry of the line 57·3 per cent.; in the Guards 67·7 per cent."

The Commissioners proceed to observe—

> "It may be stated that, in civil life, insufficient clothing, insufficient and unwholesome food, sedentary and unwholesome occupations, and the vitiated atmosphere of unhealthy dwellings, all contribute to the propagation of this class of diseases. But in the army it cannot be alleged that the clothing, the food, or the nature of the occupation in itself are of a character which would justify the imputation that they are among the predisposing causes of the excessive mortality of the soldier by pulmonary disease. If, therefore, it can be shown that the soldier in barrack breathes a vitiated and polluted atmosphere, it follows that of the four predisposing causes above enumerated, the last is the one to which the excessive liability of the soldier to this class of disease may be chiefly attributed." (p. 15.)

The Commissioners state, in support of their conclusions as to this being the chief cause of disease, that the native army of India, which is hutted, and not quartered in barracks with a number of men massed in one room, is alleged to be the only army of which the mortality is under that of the civil population. But we entertain strong doubts whether the returns from that army are to be relied on. It has been stated to us by an officer well acquainted with the system, that a large number of the men are granted furloughs, and that if they die while absent from their corps, they are not included in the casualty returns. Until accurate official statistics are published, we must withhold our assent to the statements made by Mr. Neison to the Commissioners on this subject. Nor do we attach much importance to the argument in the Report founded on the great salubrity of the army in the Crimea in the spring of 1856. The original army had been nearly annihilated, and had been replaced by young soldiers, who, arriving after judicious sanitary arrangements had been adopted in the camp, were not exposed to the same causes of disease as their predecessors, and in whom the huts, even if equally insalubrious with the barracks, had not time to develop those chronic pulmonary diseases which are the cause of the mortality in the army at home. On the same principle, the Guards might congratulate themselves on the lower rate of mortality which was certain to prevail among them for some time after their return to England, leaving out of consideration that the men are on the average considerably younger, owing to the old soldiers who perished in the Crimea having been replaced by recruits, and that in the reductions which were made on the termination of the war, all the sickly and inefficient men were discharged.

But without either of these auxiliary arguments, there was quite enough to demand a careful inquiry into the sanitary condition of the barracks. The description given by the Commissioners of the soldier's home is far from inviting. The minimum cubic space allowed by regulation is 450 feet to each soldier, but it would appear that in a majority of the barracks in the United Kingdom this minimum is not attained, and in some instances the space is less than one-half that laid down. In like manner the rule is neglected of having a distance of one foot between each of the beds; in some barracks ventilation is next to impossible, and in others, where ventilators exist, no means are taken to prevent their being stopped by the soldier.

> "The result is, that the soldier sleeps in a fœtid and unwholesome atmosphere, the habitual breathing of which, though producing for the most part no direct immediate effects, probably lays the seeds of that pulmonary disease which is so fatal in the British army."

It is probably also a cause of fever, which is more prevalent and twice as fatal a disease in the army as in civil life. But in addition to this over-crowding and defective ventilation, the atmosphere of the barrack-room at night is polluted by the urine-tub, which is used in place of the ordinary chamber utensils; a practice justly designated by the Commissioners as "filthy." Well might one of the witnesses remark—

> "That if the engineer officers had one-tenth of the experience that medical officers have of the pernicious state of barrack-rooms for want of ventilation, and if they had witnessed the use of the disgusting and indecent urine-tub, they would long ere this have improved the one and abolished the other."

With the description before us, given by several witnesses, of the condition of barrack-rooms, it excites no surprise to be told that one of them stated to the Commission—

> "That a soldier never knows a healthy home, as regards air and space, till he commits some crime which brings him into the thoroughly ventilated cell of a military prison."

As regards the selection of ground for encampments and the general sanitary arrangements of a camp or of a town occupied by troops in the course of military operations, Sir Richard Airey stated that there was no rule making it imperative to consult the medical officer. It was entirely a matter of chance, and we fear too often neglected.

> "If the commanding officer (say the Commissioners) be inexperienced and not sufficiently well-informed to be conscious of his ignorance in such matters, he does not ask for the opinion of the medical officer, and considers it intrusive if offered. On the other hand, the best and most experienced officers in the service, knowing the value of such advice and assistance, never fail to seek and be guided by it, unless, indeed, the estimate which they may have formed of the knowledge and good sense of the medical officer be such as not to inspire confidence in his opinion." (p. 19.)

Having discussed the four causes assigned to them for the high rates of mortality in the army, the Commissioners proceed to the investigation of another subject which must certainly exercise a great influence on the health of the soldiers—namely, their diet. And in this important particular the arrangements were found to be as unsatisfactory as with regard to the barracks. The daily ration supplied by Government to the soldier consists of one pound of bread and three-quarters of a pound of meat at home, or one pound abroad. The rest of the food necessary for him is purchased under regimental superintendence, to an amount not exceeding fourpence per man; and however high the markets may be, this sum cannot be exceeded. Under this system, it is impossible to obtain anything like uniformity in the amount of food supplied at different times and in different places. But if there be want of uniformity in the quantity, no such complaint can be made of the cooking, for the Quarter-Master-General of the Army states:

> "A company is generally provided with two boilers, in one of which the soldiers boil their meat, and in the other their potatoes; they have nothing else. A man goes on with it from the day he enlists till the day he is discharged. He lives upon boiled meat for twenty-one years." (Qu. 3060.)

The concurrent testimony of all the officers and non-commissioned officers examined was to the effect that the men became disgusted with this, that the broth was often left untouched, and the meat thrown away, so that the soldier, who has always been assumed as the type of a well-fed class, has in reality been half-starved from disgust at the food issued to him. That this state of matters must exert a very injurious influence upon his health will be readily admitted, and may well excite surprise that it has not long ago been changed. The men in the Guards and Artillery often send the meat to be baked at their own expense, but in the Line they cannot afford to do so. It is far from creditable to the authorities that such an evident means of improving the health and adding to the comfort of the soldier should have been so long neglected. The Commissioners have entered at considerable length into the questions of the mode of supply and the system of stoppages to defray the expense of the soldier's ration, but we deem it unnecessary to advert to these. Our interest attaches to them as exerting an influence on the health, and not as matters of finance.

The subject of clothing next occupied the attention of the Commission, and, with the exception of the tunic, every article is spoken of in terms of condemnation. Boots, stock, shako, forage-cap, great-coat, and knapsack, are in succession examined and found wanting in quality, comfort, and utility. Improvements have of late years been made in some of them, but they are still far from having attained that degree of perfection which might have been expected from a practical and a manufacturing people. Red-tapeism and official routine have, we fear, prevented the advantages of free-trade competition being extended to army supplies.

Such are the principal causes to which, in the opinion of the Commissioners, the high rate of mortality in the army at home is attributable. The questions naturally arise, Is such a state of things unavoidable? Could not the evil be mitigated, if not removed, by judicious arrangements? Would not such a result amply compensate for any additional expenditure required to effect the necessary changes? These questions may be answered in the affirmative from an examination of the facts adduced by the Commissioners in a very interesting section on the "effect of sanitary measures." They give at some length four remarkable examples of what may be done, in the prevention of disease and reduction of mortality.

The first is that of the Duke of York's School at Chelsea, "in its conditions of life, and making a due allowance for the difference of age in its inmates, an epitome of a soldier's barrack." By getting rid of the over-crowding, by ventilation of the dormitories, and by the substitution of a judicious and varied diet for the everlasting boiled beef, Dr. Balfour succeeded in reducing the mortality from 9·7 to 4·8, and the proportion annually reported unfit for military service from 12·4 to 4·6 per 1000, on the average of eight and a half years.

The second is that of the model lodging-houses, which have been constructed with great attention to sanitary arrangements, and in which the mortality has been little above half that of the metropolis.

The third example is the improvement in the common lodging-houses since they were placed under police inspection and regulations as to the numbers to be accommodated, and were cleaned, ventilated, supplied with water, and fitted with water-closets and sinks, trapped and drained to the common-sewer where practicable. The inspector states that "no fever or other epidemic diseases have visited a single lodging-house," and in 1854, only 61 deaths occurred from cholera among 82,000 inmates, or about one-sixth of the general rate over the metropolis.

The fourth example is the improvement in health and efficiency of the army in the Crimea, consequent upon abundant supplies, food of a wholesome character, and improved sanitary arrangements. The details given in the Report, and the illustrative diagrams in the Appendix, by Dr. Farr, deserve careful study, as affording the most remarkable evidence of the value of sanitary science. The Commissioners likewise refer to the evidence given by Sir A. Tulloch, of the improvements in the health of the troops serving abroad, which followed the adoption of the measures recommended in the Army Statistical Reports. The reduction of mortality in some of the colonies is very remarkable—for instance, in Jamaica it has on the average of fifteen years amounted to 68 per 1000, in Ceylon to 36, in Newfoundland to 26, and in the Windward and Leeward Command to 19 per 1000. Results such as these deserve serious consideration, and should prove a powerful inducement to perseverance in the course of sanitary improvement.

The Commissioners do not content themselves with pointing out the evils of the present system, but make the necessary recommendations for their removal. A general improvement of the barracks as regards space, ventilation, conveniencies, heating and lighting; attention to sanitary considerations in the selection of sites, and in the general arrangements; a greater amount of power to medical officers to suggest improvements bearing upon the health of the troops; an improved system of supply, with a greater variety in the description and cooking of the soldiers' diet; and a complete reform of the dress of the army, are among the principal suggestions. But perhaps the most important of these suggestions is that of appointing a sanitary officer on the medical staff of an army in the field, second in rank to the principal medical officer, and attached to the Quartermaster-General's department. It would be the duty of this officer to advise the general commanding in chief on all subjects relating to the prevention of disease among the troops, and to see that the requisite sanitary precautions were adopted. The executive duties of health officers must at all times, both in peace and war, devolve upon the regimental surgeons, but the appointment of an efficient head to the sanitary branch, whose opinion would carry weight with the military authorities, and who could superintend efficiently the labours of his subordinates, would be of the highest value and importance to the army. The Commissioners recommend in a subsequent part of the Report that an officer eminent in sanitary knowledge should be associated with the Director-General as a member of the Medical Council of the army, the constitution of which we shall hereafter notice.

Having concluded the first great section of their inquiry, the Commissioners proceed to investigate the means provided for the treatment of sick and wounded soldiers. Members of the Commission were sent to Chatham and Portsmouth to inspect the military and naval hospitals, and subsequently to Paris and Brussels to visit the principal civil and military hospitals there. The reports made by these members showed the military hospitals to be in as unsatisfactory a state as the barracks, and inferior in every respect to the Melville Hospital, at Chatham, for the Marines, and to the hospitals in Paris and Brussels. Indeed the description given of Fort Pitt in the Report fully justifies the remark that the military hospitals suffer, "not from casual deficiency in some one department, but from insufficient accommodation and supply pervading every branch of the establishment." It is but justice to Dr. A. Smith to state that, in 1843, he made a very full report of the disgraceful condition of the military hospitals at Chatham, contrasting them with the naval and ordnance hospitals; but although he was then principal medical officer there, so little attention was paid to his representations, that "the worst and most dangerous nuisances then complained of have not been removed to this day." (p. 34.)

The Commissioners have also made a comparison of the military with the civil hospitals in this country, the requisite information as to the latter having been obtained by a series of questions addressed to the proper authorities of eleven London and twenty provincial hospitals. The answers are given in detail in the Appendix, and afford much interesting information, particularly as to heating and ventilation. A detailed account is given, in the evidence of Mr. Alexander and Dr. Sutherland, of eight of the Paris hospitals, and particularly of the construction and arrangement of *Lariboisière*. It is perhaps superfluous to say, after our previous remarks, that they are much superior to our military hospitals. In comparison with civil hospitals, the Commissioners remark:

> "The matters in which the English hospitals are superior or inferior to the French are those in which the same superiority or inferiority is to be found in civil life. In the spaciousness of the building, the excellence of the beds, and the means of cooking, the private house in France is superior to the English, while it is inferior in everything relating to the supply of water, and to internal drainage and sewerage, which, next to ventilation, are the two most important points in a hospital." (p. 37.)

In describing the system of supplying the military hospitals, of executing repairs, or of obtaining alterations and improvements, the Commissioners detail the various departments concerned, and processes to be gone through; the practical result of the system being, that

> "Applications have been made for years to the engineer department for the execution of works and repairs, some urgently necessary for the health and safety of the patients, which have either been long delayed, or in some cases not executed at all."

And, in some instances, the opinion of the engineer has been permitted to overrule the professional opinion of the medical officer, and even of the director-general. The process necessary for obtaining repairs, as described by the witnesses, reminds one not a little of the nursery tale of "The House that Jack built."

We have noticed these points because they forcibly illustrate the necessity, in the interests of the patients, of giving to the medical officer power to originate and carry out improvements in the hospital; and, in the event of his authority being disputed, or his opinion overruled, of having some higher and impartial authority to whom he may appeal.

A description is given in the Report of the new hospital in course of construction at Netley, and in Captain Laffan's evidence there is a detailed account of the mode in which the site was selected and the plans were prepared. For these we must refer the reader to the Report itself, observing merely that both site and plans appear to have been approved of by Dr. Smith, "and that no step was taken without the opinion and sanction of the Army Medical Department." It is much to be regretted that the medical officers on whom Dr. Smith relied to advise him, and the engineer officers by whom the plans were drawn up, did not visit Paris with a view to examine the most recent improvements in hospitals there; nor does it even appear that they inspected any of the new ones in this country. That Netley is better designed than any of the existing military hospitals may be admitted; but that it is much less perfect in its construction and arrangements than such an establishment should be in the present day is, we fear, undeniable.

The necessity for general hospitals is discussed by the Commissioners, and the evils of the present system shown. The question of the provision for lunatic soldiers also engaged their attention, and chiefly, as it appears, on the authority of Dr. Conolly, a recommendation is made in favour of a small lunatic hospital for the treatment of recent and acute cases, trusting to civil establishments for the permanent reception of such as do not, within a certain period, recover under the treatment adopted there.

In considering the distribution of duties in hospitals, the Commissioners express a most unfavourable opinion of the system by which so much administrative duty is thrown upon the medical officer. In naval hospitals, "the higher the medical officer rises in his profession the greater is the amount and responsibility of the medical treatment which devolves upon him." But this is not the case in the army. The Inspector never treats the sick; his duties are entirely administrative, and the patients fall to the care of the surgeons and assistant-surgeons. Everything required for the sick must be obtained by requisition, and these requisitions must be approved by the principal medical officer, who, however, knows nothing of the case. His control, therefore, must either be a farce or injurious. The Commissioners condemn the whole system, and recommend that it should be remodelled in such a manner that the experience of the senior officers should be available for the treatment of the sick, and that the duties of supply should devolve upon the purveyor, subject to the orders of the medical officer, under regulations which would greatly diminish the necessity for those never-ending requisitions. Miss Nightingale thus records the result of her experience of the working of the present system of requisitions, checks, and counter-checks, at Scutari:

> "This system of checks and counter-checks seems to have been invented for the purpose of saving money instead of for that of saving the lives of the sick. Now it fails in its object both ways, because the lives of men are of more money value to the country than any saving can ever by any possibility be in such matters; and also because it actually wastes money, for the clerk system and check system require such a staff as to cost far more than the additional supplies would do. No system can be more expensive than ours, for these reasons. It is also inconsistent with prompt and efficient action, and consequently hazardous to the sick." (Q. 10,051.)

On the subject of field hospitals, the Commissioners availed themselves of the experience gained in the late war. They have brought under notice the chief defects which interfered with their efficiency, and have offered some valuable suggestions for the future—the leading principle involved in these being, to render the medical department less dependent upon other branches of the army for those supplies which are essential to the proper treatment of the sick and wounded.

Complaints having been made as to the system of inspections of hospitals, &c., the Commissioners have thought it necessary to notice it. Admitting the necessity of inspections, they remark:

> "In the Army Medical Department the inspector and inspected are both men of science, and the latter is actually engaged in treating, at his own discretion and on his own responsibility, the patients who have been entrusted to him on the presumption of his competency. The assumption on the part of a superior medical officer of a peremptory tone in addressing his junior shows a want of appreciation of the dignity of the profession to which both belong. A rebuke addressed, or a doubt thrown on the treatment, in the presence of the patient, shakes the confidence of the latter in the medical officer in whose hands, without any choice of his own, he is placed, and may even mar his chance of recovery.
>
> "We are satisfied that such departures from propriety, meriting as they do the severest reprobation, can be but of rare occurrence; and we have made these remarks in the belief that they will strengthen the hands of the Director-General in checking them when they do occur." (p. 50.)

In these sentiments every right-thinking man will concur; we trust the Commissioners are correct in supposing the tone of undue assumption on the part of inspecting officers to be of rare occurrence, but the evidence given before them by medical officers would rather lead to another inference.

Having considered the means employed for the prevention and treatment of disease, the Commissioners next proceed to examine the system of recording it. They refer to the complaints made by the medical officers "of the great amount of clerical labour thrown upon them by the cumbrous nature of the returns required, and the unnecessary writing caused by the unceasing and frequent recourse to the system of requisitions." After a detailed notice of the records now in use, and some suggestions with a view to their simplification, they recommend a complete revision of the regulations affecting the department, many of which have become obsolete, owing to changes in the military branches of the service without any adaptation of these rules to the altered circumstances.

The consideration of army statistics appears naturally to follow that of returns and records, and the Commissioners have accordingly given, from Sir A. Tulloch's evidence, a brief history of the origin of the reports on the sickness, mortality, and invaliding of the troops, which have been laid before Parliament, and to the practical value of which they bear strong testimony. They recommend the organization of a statistical department at the Army Medical Board, which should prepare and publish returns of the sickness and mortality of the troops at home and abroad, "in order to secure the adoption of the measures necessary to relieve them from the continued influence of conditions deleterious to health and life." They observe that at present

> "Neither in the War-Office, nor in the department of the Director-General, is there any statistical department for the reports to which we have alluded, and to the great value of which we have borne testimony, and the country is indebted for them to the voluntary exertions of two gentlemen, one of whom is the Superintendent of Pensioners, and the other the Medical Officer to the Royal Military Asylum at Chelsea." (p. 52.)

With the introduction of an official department of this kind must come a revision of the nomenclature of diseases, for it would appear that up to the present time "the nomenclature used in the Army Medical Department is that of Cullen's nosology, which dates from the year 1780." It is difficult to understand why the head of the department has never taken any step to bring the returns up to the present improved state of medical science. In this particular, at least, there was no control of, or dependence upon, other departments. With him alone rests the blame of being very far behind the rest of the profession.

The next subject noticed in the Report is the "invaliding" of soldiers; but as the details relate almost exclusively to the manner in which this duty is performed, and to the arrangements for granting pensions, we deem it unnecessary to enter upon it in these pages.

Having thus inquired into the extent of mortality in the army; the regulations in force for preserving the health of the soldiers; the means available for their treatment when sick; and the system by which they are removed from the ranks when no longer effective; the Commissioners naturally arrive at the last great branch of the inquiry —namely, the regulations affecting the *personnel* of the Army Medical Department. These are examined under the various heads of—education—pay and retirement—promotion—roster of service—relative rank—and constitution of the governing body.

Education.—It appears from the evidence of Dr. A. Smith, that all candidates for admission into the department must possess a diploma in surgery either of the Royal College of Surgeons of England, Dublin, or Edinburgh, or of the Faculty of Physicians and Surgeons of Glasgow, or of Trinity College, Dublin; that they must produce evidence of having attended certain courses of lectures; and they must pass an examination at the Army Medical Board. Latterly this examination has been made competitive, but a sufficient number of candidates do not come forward to enable this new rule to be carried into effect. The diplomas of the different licensing bodies, however, are evidences of a very different amount of professional knowledge; that of London for example, is merely a proof of surgical knowledge, while the others comprise also materia medica, chemistry, and practice of physic. Dr. Smith considers the examination at the Army Medical Board sufficient to compensate for this and to test the general acquirements of the candidate, but the Commissioners are of opinion, "that in all cases such certificate as would qualify a civilian to practice medicine as well as surgery, should be exacted of the candidate." Again, the student at Edinburgh and Dublin has the opportunity of attending lectures on military surgery, but nowhere else have chairs for this branch of professional study been instituted. Dr. Smith, however, states, that no difference is made in the examination, nor in the subsequent course at Chatham, between those who have and those who have not attended such lectures. Indeed, Sir B. Brodie, Dr. Smith, and several other witnesses, pronounced them, as at present organized, to be useless, and Mr. Fergusson, who spoke from personal knowledge of those at Edinburgh, declared them to be injurious.

The candidate having passed his examination, is sent to the general hospital at Chatham, where he is professedly taught the application of splints and bandages, and is required to become acquainted with the regulations of the service, and the compilation of the various returns furnished by medical officers. His efficiency as an operator, his aptitude for describing disease, and his knowledge of pathological anatomy are also tested. But as the period of his stay at Chatham is quite uncertain, depending entirely on the exigencies of the service, these instructions and tests are in many instances of little or no value. In our army there is no regular course of instruction in the specialties of military practice given to the young medical officer, and he is consequently too often left to acquire his knowledge at the expense of the health, or, it may be, the life of the soldier. In addition to a more searching competitive and practical examination by an independent board of examiners, the Commissioners recommend the formation of a school of military medicine at Netley, or the chief general hospital, wherever that may be, where the candidate must go through a course of instruction, of stated duration, in the specialties of his profession, at the end of which he shall be re-examined, and his commission be made to depend upon the result of that examination.

Formerly an assistant-surgeon was required to pass an examination before promotion to the rank of surgeon, but although the rule is still in existence, it has been in abeyance for many years, partly on account of its unpopularity, and partly from the difficulty of carrying it out in such a manner as to make it of any use. The Commissioners recommend its enforcement, and as it is the practice in the navy, there seems no reason why it should be found impossible to make it a useful test of an officer's acquirements and diligence in the army. The Commissioners remark that—

> "Not only would it be valuable as a test of the use which a young medical officer has made of the opportunities afforded him since he received his first commission, but it would operate from the moment he joins as a strong inducement to study at a time when the tone and amusements of young officers, with whom he for the first time associates, offer the strongest temptation to idleness and dissipation, and when habits are formed which probably colour his whole after career." (p. 61.)

But to carry out such a system, it will be necessary to grant to the assistant-surgeon an opportunity of refreshing his knowledge, and bringing himself up to the mark by revisiting the hospitals and attending lectures. For this purpose arrangements must be made to grant him leave of absence, the necessary precautions being taken to ascertain that the period so granted is devoted to the purpose for which it is intended.

Pay and Retirement.—The unanimous opinion of the medical witnesses from civil life was, that the pay and retirement of the army medical officers are not such as to induce the best class of medical students to become candidates for commissions, and they stated that they do not recommend them to do so. Such an opinion expressed by Sir B. Brodie, Mr. Fergusson, Mr. Paget, and Dr. Parkes, backed as it is by similar testimony from the governing bodies of the Universities and Royal Colleges of Physicians and Surgeons, ought to weigh powerfully with the Government in inducing them to carry out the recommendation of the Commission, that "a considerable augmentation be made to the pay and retiring allowances of the army medical officers." Looking to the gallant deeds which have been done by our soldiers in the Crimea and in India, it surely is not too much to demand for them that Government should take the necessary steps to ensure to them on the battle-field, and in the hour of sickness, the most efficient aid which medical science can give, and should not, by an ill-judged parsimony, reduce them to the necessity of being treated by an under-educated or inefficient medical staff.

Promotion.—One of the principal grievances of the medical officers in the Crimea, as stated in their memorial to Lord Panmure which was laid before Mr. Stafford's Committee, was that the promotion did not appear to be regulated by any fixed principle; and that on a point of such vital importance they were entirely at the discretion of the Director-General. To this question, therefore, the Commission naturally directed its attention; medical officers were called who did not hesitate to bring forward cases in support of their assertions; and Dr. A. Smith was afforded an opportunity of answering their statements, and explaining the cases. The system on which promotion is conducted was explained by Dr. Smith to be that of dividing all the military stations into groups, and giving death vacancies which occurred there to the senior assistant-surgeon in the group; but vacancies created not by death, but promotion, are given to the senior in the army, without reference to where he may be serving. The reason assigned for the grouping of stations is the cost of moving medical officers under any other system, and the length of time during which a regiment might otherwise be left without a surgeon. But the present system carries absurdity on the face of it, for the cost and inconvenience must be equal whether the vacancy arise from a death or from promotion, but in the latter case the senior in the army is taken. It is stated, however, "to be the practice of the Director-General, who is anxious to prevent any general rules from operating harshly on individuals, to avoid such a result by a fresh enactment to meet each special case as it arises." Here, then, appears to be the explanation of the complaint of the Crimean petitioners; there is no written law of promotion in the department, but a system is professed to be worked from which deviations take place whenever a case arises which appears to the Director-General to operate harshly towards an individual officer. The exception to the rule occurs, and appears to be an act of favouritism, because no explanation is given, while the officer who would otherwise have got the promotion considers himself unjustly treated. Dr. Smith himself admits this, for he says in his evidence,

> "They think that I have been acting unfairly when, if they knew the circumstances, which I have often mentioned to them when they complained, they would have seen that I could not have acted in any other way." (Qu. 7425.)

And again:

> "I think I have already shown that the statements which have been advanced by certain medical officers to prove mal-administration, have been made in ignorance of the circumstances which rendered necessary the acts of which they complained. Ignorance in this respect will always prevail, therefore the head of the department must expect that many of the measures he will have to adopt for the interests of the service will be misunderstood, and even misrepresented." (Qu. 9466.)

Upon this "hand to mouth" system of administration the Commissioners observe:

> "Practically, the result has been that in the lower ranks the principle of seniority, so far as it consists in promoting each man in his turn, according to the date of his entry into the service, is nullified; and the rules by which the Director-General seeks to compensate for such departures from the strict principle of seniority, and equalize the chances and the career of each officer, being unknown to the service, dissatisfaction has been created, and sometimes even motives have been imputed, which a full explanation of the history of each case would often show to be entirely unfounded. To us it appears that such a result not unnaturally attends a system where so much explanation is necessary, and so little can be given; and we doubt whether any large department can be satisfactorily administered, except on some simple and intelligible principles, which should be patent to all, and which should not be departed from, except on occasions previously specified." (p. 67.)

After fully detailing the advantages and disadvantages of the various systems on which promotion may be conducted, the Commissioners arrive at the conclusion,

> "That an adherence to the rule of strict seniority in the lower ranks, with some exceptions which we will afterwards specify, and strict selection in the upper ranks, constitute, upon the whole, the system most likely to work beneficially for the public service." (p. 68.)

Under this head the Commissioners have also gone into the question of the necessity for retaining the rank of first-class staff-surgeon, and have decided it in the negative. The principle which appears to pervade these recommendations is that of improving the position of the executive ranks, and throwing upon them more responsibility than at present; at the same time, by diminishing the necessity for inspections as now conducted, they get rid of the somewhat anomalous rank of first-class staff-surgeon, and by increasing the number of deputy-inspectors, who are necessary for *bonâ fide* administrative duties, add to the number of prizes in the department. Dr. Smith has recorded his dissent from this plan, but Mr. Sidney Herbert, as President of the Commission, states his continued adherence to the recommendations, and his dissent from Dr. Smith's objections, as he

> "Entertains the opinion that the army medical officers are over-inspected at present, and that the responsibility of the executive officers, and the interest in their profession which attaches to responsibility, is thereby weakened." (p. 84.)

Roster of Service.—The Commissioners recommend, in general terms, the adoption of a roster, subject, however, to the qualification that it should not be permitted to interfere with the Director-General's selection of any officer, whatever his place on the roster, for special appointment to any station or duty for which, from experience and character, he might be deemed to be specially qualified.

Relative Rank.—Of all the grievances brought forward by the army medical officers, perhaps there was none which gave rise to a greater feeling of injustice, and consequent irritation, than their position with reference to their brother officers. A specific military rank was assigned to them by their Sovereign, coupled only with the very reasonable condition that it should not confer on them the right to military command. But they were, in effect, deprived of many of the advantages of the rank thus given to them. They did not share equally in the distribution of honours; they did not receive the allowance of prize money or the pension due to their rank; and their widows were granted only the pension of the widow of the military officer next below them in rank. From the want of well-defined regulations, the position of a medical officer on courts of inquiry, or boards, depended in a great degree upon the good feeling or caprice of the commanding officer, and in India, by an order of the Commander-in-Chief, in direct opposition, as it appears to us, of her Majesty's regulations, on committees composed of military and medical officers, the former were invariably to take precedence. At the beginning of the Crimean war, the injustice to the widows of the medical officers was brought under Lord Panmure's notice, and was immediately remedied by a Royal warrant granting to them the same rates as to the corresponding military ranks. On the personal question of the position of the medical officer, we quote with great satisfaction from a very able Minute on the Indian Medical Service, by Lord Dalhousie, which has been printed in the Appendix to the Report now before us. His Lordship says:

> "32. There are several particulars in which the medical service, as a body, lies under great disadvantages, and which they regard—justly, in my opinion—as grievances that ought to be removed. I refer to the inequality which now prevails between the position of a medical officer and that of his brother officers in respect of pension, honours, and rank. I respectfully submit that such inequalities are founded on no sound grounds of justice, expediency, or policy; no valid reason ever has been or can be alleged for maintaining them. Their effect is to depress the spirit of the medical officer, to depreciate a profession and class of service which ought to be held in the utmost respect, and supported equally from motives of prudence and gratitude."

After commenting on "the absurdity of regarding a medical officer as a non-combatant," his Lordship proceeds to observe:

> "35. But the most galling, the most unmeaning and purposeless regulation by which a sense of inferiority is imposed upon medical officers, is by the refusal to them of substantive rank. The surgeon and assistant-surgeon rank invariably with the captain and lieutenant, but the rank is only nominal wherever medical officers and others are brought together on public duty; the former has no rank at all, and the oldest surgeon on the list must in such case range himself below the youngest ensign last posted to a corps.
>
> "36. It is impossible to conceive how such a system as this can have been maintained so long, on the strength of no better argument than that 'it has been,' therefore 'it ought to be.' It is impossible to imagine what serious justi-

fication can be offered for a system which, in respect of external position, postpones service to inexperience, cunning to ignorance, age to youth; a system which gives a subaltern who is hardly free from his drill precedence over his elder, who perhaps has served through every campaign for thirty years; a system which treats a member of a learned profession—a man of ability, skill, and experience—as inferior in position to a cornet of cavalry just entering on his study of the pay and audit regulations; a system, in fine, which thrusts down grey-headed veterans below beardless boys." (p. 417.)

Concurring in the justice of these observations, the Commissioners have made a series of recommendations, which, if acted on by Government, will abolish all such unjust distinctions, and secure to the medical officers those advantages which they have a right to expect from the rank bestowed on them by the Sovereign. Already an important step has been taken in the right direction. The East India Directors having carefully considered the representation of Lord Dalhousie, ordered, on the 10th of June last, that "whenever committees composed of military and medical officers are convened by the Commander-in-Chief, the President is invariably to be a military officer, and the members are to take precedence according to their relative rank." A similar order has been issued by H.R.H. the Duke of Cambridge, in accordance with the recommendation of the Commissioners, so that we trust this source of annoyance and irritation is now finally set at rest.

Constitution of the Army Medical Department.—Before concluding their Report, the Commissioners have discussed the question of the best form of government for the department. After a brief sketch of the different forms of administration which have prevailed, and an examination of the mode in which analogous bodies are conducted, they have come to the conclusion that the most efficient system is that of a responsible Director-General, with a Council attached to advise with him in all questions of difficulty, but having no vote or power to interfere with his decisions beyond recording their opinions. The Council is to consist of three members, who are to superintend the professional, statistical, and sanitary details of the department respectively, under the control and authority of the Director-General. To this plan Dr. Smith objects, but the reasons he assigns do not appear to us sufficient to counterbalance the very lucid argument upon which the Commissioners have based their proposition. Their object, as stated by Mr. Sidney Herbert, has been,

> "To fix responsibility on one man, and on one only, but to secure to him before his decision is given the advantage which results from hearing the opinions of others, so that the matter under discussion shall have been presented to his consideration under all the aspects in which it can be viewed; at the same time, business of a mere routine character will be expedited by its allotment to the heads of each department under such regulations as shall insure to the Director-General an acquaintance with all the current transactions of the office." (p. 84.)

It was our intention to have noticed at some length the evidence of Miss F. Nightingale, who was examined by means of written questions. It contains many interesting details as to the extent and causes of the mortality in the Crimea; the errors of the hospital system in operation at Scutari; the sanitary defects in these hospitals; the want of supplies, and the difficulties experienced in getting them even when in store; and the mode in which such difficulties were overcome, and may be prevented in future. We are, however, reluctantly compelled to postpone this part of our labours, but hope to make use of the materials when we are able to lay before our readers a notice of Dr. Smith's long-promised, but still forthcoming, statistics of the late war. In the mean time we recommend to their perusal this part of the Report, in which they will also find the results of Miss Nightingale's experience as to the organization, management, and supply of hospitals, and arrangements for nursing the sick.

We have thus briefly noticed the leading points in the Report. Want of space has compelled us to pass over many details on which we could with satisfaction have expatiated. The volume cannot fail to prove useful to those entrusted with the government of the department, and the copious appendix will be often referred to by all students of vital statistics.

With regard to the tone and composition of the Report, we fully concur in the following description of the *Times*:

"The Report is not the production of zeal without knowledge; political feeling does not enter into it, nor, indeed, feeling of any kind, except an evident wish to arrive at truths that are not always on the surface. The style is perfectly temperate, with no partial colour or exaggeration. The facts are left to produce their own impression, and that is often stronger than would be made if they were dressed with all the flowers of rhetoric; and a praiseworthy impartiality is preserved throughout the Report. . . . . The reader may infer from it as much as he pleases, and be moved to ridicule or indignation according to his nature; the Commission never expresses either emotion. Emotion would disturb statistics, and feeling has no place in a table of averages; to probe the wound and apply the knife steadily is the surgeon's duty; a tendency to the hysterical at the crisis of a case would prove his ruin. The cold, unimpassioned style of the Report is a merit."

REVIEW XI.

Pathological and Practical Observations on Diseases of the Alimentary Canal, Œsophagus, Stomach, Cæcum, and Intestines. By G. O. HABERSHON, M.D. Lond., Fellow of the Royal College of Physicians, and Assistant-Physician to Guy's Hospital, &c.—*London*, 1857. 8vo, pp. 387.

WE believe that this book will be read with interest. It is calculated to impart instruction to all of us. How could it well be otherwise? A field of observation like that afforded by Guy's Hospital probably does not exist elsewhere, and it would indeed be strange if a physician of that institution could not illustrate well from his own experience all the ordinary, and most of the extraordinary, diseases that are met with in this country. But to do this labour must not be spared. Clinical research, the recording of facts and their subsequent careful classification and arrangement, can never be substituted by merely extensive opportunities.

The text of the work forms an excellent summary of our practical knowledge of the diseases discussed, and the treatment suggested mostly recommends itself to the approval of all who have had experience in their management. But we must add, as much as anything to avoid repetition, that every section is *not* illustrated by "the instances themselves;" that where instances are given (and there is a record of 163 cases), they do not always illustrate the text; that many are exceedingly incomplete, and often fail to furnish the inferences which it is professed to draw from them. We are far from saying that this defect is invariable, or that it would have existed in any section had the cases been published with all their details; nor would we be understood to imply that the inferences are such as medical observers are not likely to find borne out by the experience of a large hospital. All we affirm is, that the grounds for these conclusions often do not exist in the cases as narrated.

In the first chapter, which is introductory, the author briefly reviews the diseases of the alimentary canal in the light reflected upon them by the anatomy and ascertained physiology of the organs concerned. The whole chapter is excellent. We question, however, whether Dr. Habershon could maintain his position when he classes henbane with opium as diminishing the peristaltic action of the bowels. In common with the mass of the profession, we have been in the habit of combining it with purgatives—as, for instance, with colocynth—without observing any reduction in their efficiency. We once had an old gentleman as a patient, who marked a box of five-grain pills of extract of henbane, which we had prescribed to allay his cough, "aperient pills," and constantly used them when his bowels were at all costive.

Chapter II., On Disease of the Œsophagus, is, as might have been expected, principally occupied by an account of the causes of dysphagia, which are thus enumerated:

> "1. From disease of the tonsils or palate. 2. From diffused inflammation of the cellular tissue of the pharynx or œsophagus, or from local suppuration, sometimes in connexion with disease of the spine. 3. From disease of the laryngeal cartilages or epiglottis. 4. From functional or spasmodic stricture of the œsophagus or pharynx, as in hysteria, hydrophobia, &c. 5. From paralysis of the muscles. 6. From acute inflammation of the mucous membrane. 7. From mechanical injury or poison. 8. From structural obstruction to the œsophagus, as (1) constriction; (2) ulceration, sometimes communicating with the larynx; (3) cancerous disease; (4) obstruction from the pressure of aneurismal or other tumours." (p. 13.)

After observing that "the most marked true spasm of the pharynx and œsophagus is found in hydrophobia," a case is mentioned in which,

> "Besides great congestion of the membranes of the brain and spinal cord, the pharynx was the only part affected, and the appearance here was very peculiar. The organ appeared more than twice its natural capacity; the con-

strictor muscles retracted to the utmost; the fauces exceedingly large, from the rigid contraction of the soft palate; and every part appeared expanded to the utmost." (p. 17.)

A class of cases is alluded to, in which inability to make the attempt to swallow may, in insane persons, be construed as paralysis. Dr. Habershon draws attention to the difficulty there sometimes is in deciding between deep and extensive ulceration and cancerous disease of the gullet as a cause of dysphagia. In the ulcerative cases, where a fatal result from starvation is imminent, and where, from the position of the disease, œsophagotomy would be not only difficult but ineffective, the suggestion to establish a gastric fistula meets with favour at his hands. The readiness with which such fistula may be formed in animals renders it probable that a similar operation performed upon the human subject might not be succeeded by any severe peritonitis. The remarkable case narrated by Dr. Murchison will also occur to our readers, in which a woman of highly hysterical temperament safely effected such an opening by binding a copper coin upon an incision in the integument. The pulmonary complication in cases of fatal cancer of the gullet is especially insisted on:

"In only 1 out of 13 cases did death appear to result from inanition, and then not altogether free from disease of the lungs. In 7 there was pneumonia; in 2, gangrene of the lung; in 1, acute bronchitis and laryngitis; in 1, pleurisy; in 1, cancer of the lung, with great congestion; in 1, death from inanition." (p. 31.)

Dr. Habershon recommends, for the temporary relief of the dysphagia, that the attempt to swallow solid food should for a time be avoided; and if the swallowing of fluids should be very difficult, that the patient should for a short time be supported upon nutrient injections alone. In one case narrated, such abstinence for a single day enabled the sufferer on the following day to take beef-tea, eggs, milk, and brandy.

In the third chapter, On Organic Diseases of the Stomach, the following explanation is suggested as to the mode in which fatty degeneration of the gastric follicles may be brought about:

"The effect of loss of nervous power in a limb manifests itself sometimes by extreme fatty degeneration of the muscular fibres, and in these we are able to trace distinctly the cause to its effect. We do not, however, know in the same way the precise influence or action of the large nerve-ganglia in the alimentary canal upon the viscera to which they are distributed; but in wasting diseases, such as chronic abscess or phthisis, we cannot suppose that with the diminished and impoverished condition of the blood, the wasting of all the voluntary muscles, and the gradual subsidence of every nutritive change, that these large nervous centres should alone continue to act with the energy of health. They are probably also affected, and in fatty degeneration of the follicles of the stomach, the cause is, probably, not in that viscus itself, but in the large sympathetic ganglia of the abdomen; and hence its association with other degenerative changes." (p. 55.)

There is a brief section in which post-mortem solution of the stomach is discussed. The following curious sentence certainly requires explanation:

"Sudden *death* during digestion, or in some forms of cerebral disease, especially inflammatory disease in a young subject, appears to *stimulate* the follicles to pour out secretion *at irregular times* and in excessive quantity." (p. 58.)

What could possess Dr. Habershon to pen this? Of course the italics are not his.

The account that is given of ulceration of the stomach, which is divided into "superficial," "follicular or aphthous," and "chronic and perforating," ulceration, is very good, and the rules laid down for treatment judicious. The cases, however, related in illustration are so brief, that it is impossible for the reader to satisfy himself as to the correctness of the inferences. Take, for instance,

> "Case XXXV. *Superficial Ulceration of the Stomach. Catarrh of the Colon. Cirrhosis.*— ——, aged twenty-four, a coachman, of intemperate habits, after exposure to cold, had ascites; in about six weeks he was tapped; peritonitis came on, and he died." (p. 75.)

The post-mortem appearances are dismissed in four lines and a half; and it is merely stated that "the stomach was in some parts congested, thickened, and mamillated, and in several parts presented superficial ulcers about the size of a sixpence, involving only the mucous membrane." This case is adduced as a marked instance of the insidious character of chronic disease. It is true occasional vomiting is subsequently alluded to, but we are told nothing about the presence or absence of pain, tenderness, dyspeptic symptoms, &c. Case XLIV. is another example of this deficiency; apart from the post-mortem appearances it runs thus:—"Ellen R., aged twenty-five, admitted July, 1847, and died August 5th. History not known, except that she had fæcal vomiting." (p. 86.) One would have expected that during the five days at least that the patient occupied a bed in Guy's Hospital, something more would have been discovered than that she had fæcal vomiting. We should also have expected from Dr. Habershon that the experience of so large a hospital would have been brought to bear upon the relation of ulcer and of cancer of the stomach to sex and age, and are disappointed in finding that he contents himself with quoting Dr. Brinton's recent essay upon the subject. Not a single case is given illustrative of the beneficial effect of treatment in ulcer of the stomach. The only case narrated in the section of treatment does not mention the subject at all. What conclusions, then, can the reader draw? We defy any one to discover sufficient materials for those conclusions also with which our author winds up his remarks upon "cancer of the stomach," in the nine preceding cases which are stated to indicate them. We do not question the abstract truth of the author's inferences.

Chapter IV., On Functional Diseases of the Stomach, constitutes a good summary of our knowledge of this obscure subject. A special section is devoted to hæmatemesis. Although there are very few who now believe in hæmorrhage "by exhalation," in opposition to its invariable occurrence by rupture of some part of the containing system of vessels, the following quotation will be read with interest. It meets an argument that used to be adduced from the impossibility of discovering the ruptured vessels in some cases of fatal hæmatemesis.

"Much discussion has arisen as to the transudation of blood through unruptured capillaries; if, however, any one will take the trouble to examine a portion of intestine distended with blood from diseased mitral valve, and presenting spots of ecchymosis, they (*sic*) will observe what is probably the course of the change which takes place: some of the capillaries are found beautifully injected, and others are collapsed, with blood extravasated around them, but restrained by the basement membrane, thus constituting a point of ecchymosis; if the basement membrane had given way, the escape of blood would have emptied the capillaries, and no ruptured vessel have been observed. A similar action takes place in the stomach; we find ecchymosis there, but the action of the gastric juice prevents our observing the changes with the same facility; there is little doubt that the capillaries in this way are over distended, then ruptured, and constitute the ordinary form of hæmatemesis when no ulceration has taken place." (p. 137.)

At the conclusion of this section, two cases are "adduced as instances of forms of hæmatemesis of very frequent occurrence." The first of these, Case LXVIII., is headed "*Hæmatemesis, Vicarious Menstruation, Aggravated Hysteria simulating Fever.*" We may be permitted to question whether vicarious hæmatemesis of this kind, apart from other coexistent causes of gastric hæmorrhage, *is* of *very frequent* occurrence. Our own experience scarcely furnishes us with a solitary undoubted instance of it; we certainly should require some better proof of it than that furnished in this case. The girl stated, that from sixteen years of age, when she had "a convulsion, followed by 'brain fever,'" for a period of three years, and up to within nine months of her admission, with aggravated hysteria, into Guy's Hospital, she vomited blood "for three days successively, at regular monthly periods," but "never menstruated properly." Dr. Habershon, as it appears to us, should, if the occurrence were really so very frequent, have adduced a more satisfactory illustration than one derived from the uncorroborated tale of a highly hysterical female.

There follows a chapter (V.) On the Duodenum. With regard to ulceration, the author says—

Pain several hours after food, sallow complexion, furred tongue, feebleness of circulation, mental depression, nausea, irritable bowels, have been ascribed in some cases to ulceration of the duodenum, but facts do not warrant us in such precise description. In several instances we have observed there were no such indications." (p. 151.)

He tells us truly, that "ulceration of the duodenum must be remembered both as the source of fatal perforation and of intestinal hæmorrhage." The latter occurrence, important as gastric hæmorrhage as a symptom of ulcer of the stomach, meets with no illustration.

We are pleased to see that Dr. Habershon adopts in Chapter VI. the division of "enteritis" into "muco-enteritis," affecting the mucous membrane alone, and the deeper affection, "enteritis" proper, implicating all the coats of the bowel. The first, we think, is very properly identified by him with the "infantile fever" or "gastric remittent fever" of children. The chapter is altogether a good one.

Chapter VII., On Strumous Disease of the Alimentary Canal, is one of the best in the book. The various forms under which it is observed are there enumerated.

> "1. As it occurs especially in infants—diarrhœa, with or without strumous disease of the mesenteric glands, often induced by, and in many cases leading to, uncontrollable purging. 2. Primary disease of the mesenteric glands. 3. Tubercle in the peritoneum, and strumous peritonitis in its several forms. 4. Tubercle in the mucous membrane, with enteritis, leading to softening, ulceration, and perforation, as is frequently observed in phthisis. 5. Tubercle in the appendix cæci." (p. 173.)

As it occurs in infants, the appropriate alimentation is carefully laid down by the author. We cannot agree with him, however, in regarding a wet nurse as a *dernier ressort*, in preference to which, as we understand him, he would have us try tops and bottoms, dried flour, and biscuit powder. A wet nurse is undoubtedly, as many can testify beside ourselves, for the most part a source of great annoyance in a house, but our experience has taught us that nature knows much better than we do what is the appropriate food for a delicate infant.

The Eighth Chapter, On Diseases of the Cæcum and Appendix Cæci, is again well worthy of perusal, and the cases recorded are such as illustrate the clinical features of the affections described, better than those in earlier chapters. We transcribe Dr. Habershon's remarks upon the diagnosis in cæcal disease, as an example of the mode in in which he treats his subjects—

> "In the diagnosis of cæcal disease, it must be borne in mind that simple excessive distension of the cæcum is sometimes accompanied with severe pain.
>
> "2. That after blows on the abdominal parietes, suppuration sometimes takes place among the muscles, and may be accompanied by local peritonitis without cæcal disease.
>
> "3. It must be remembered, that suppuration connected with the right kidney or its envelopes, sometimes extends into the iliac fossa.
>
> "4. That we may have disease of the vertebra, or iliac bones, leading to suppuration.
>
> "5. Pain arises in the course of the last dorsal nerve from diseased spine, or in the course of the genito-crural nerve from renal calculus, and might be confounded with cæcal inflammation, &c.
>
> "6. Inflammatory disease in connexion with the ovaries, leading to local peritonitis and severe pain, is frequently mistaken for cæcal disease.
>
> "7. Cancerous disease of the cæcum; and
>
> "8. Disease of the ilium in struma, or after typhoid fever; as well as,
>
> "9. Strumous peritonitis, must each be remembered in forming a correct diagnosis.
>
> "The pain in simple distension of the cæcum is less severe. Disease in the parietes in a very short time manifests its local character. The pain and swelling connected with suppuration of the spine or kidney differ in position; that of the kidney is more in the loins, or if extending anteriorly nearer to the medium (*sic*) line. Spinal suppuration extends beneath the iliac fascia, and would be distinguished from cæcal disease burrowing beneath Poupart's ligament, by the fæcal character of the latter.
>
> "The neuralgic pains connected with urino-genital disease is (*sic*) not accompanied with the tenderness or the other symptoms of intestine affection. It is, however, sometimes difficult to distinguish inflammatory disease about the right ovary from cæcal disease. There may be in both excessive tenderness, febrile excitement, constipation, severe pain in the lower part of the iliac fossa. The symptoms which will serve to guide us are, that the ovarian

disease comes on with irregular menstruation or with sudden cessation of that flux, and that the pain is situated lower down in the hypogastric region;—in some cases even, observers have believed that they have felt the swollen ovary. Dr. Barlow records a case in which peritonitis of such a severe character was set up around an inflamed ovary, that the patient succumbed. In cancerous disease of the cæcum, which sometimes occurs in young subjects, it is almost impossible, unless there be indication of cancerous disease in other parts, rightly to diagnose its character. These are, however, rare cases. In strumous peritonitis the disease is not confined to one part of the abdomen; but in severe cases the intestines are so completely united by peritoneal adhesions as to move *en masse*. It is impossible to distinguish perforation of the ilium, in struma or phthisis, from perforation of the appendix cæci; it is, however, of little moment, since the only remedial agents which are likely to be of service in these almost universally fatal cases are precisely similar in both." (p. 207.)

An interesting case is recorded, in which a loosely-attached moveable cæcum had passed over into the left iliac region, and become the seat of an obstruction.

After a brief chapter upon Diarrhœa, comes an important one, the tenth, On Colitis and Dysentery. The author states that he has only once observed at Guy's Hospital pyæmia and suppuration of the liver as a sequel of simple English dysentery.

Ten cases of fatal dysentery are related, which Dr. Habershon says indicate—

"1. That dysentery of a most severe form arises in our own country, and is not of unfrequent occurrence. 2. That the cause of death in some is the extent and severity of the affection. 3. That some die from perforation and fæcal abscess. 4. That pyæmia follows some of the worst forms of English dysentery. 5. That the constriction of the intestine sometimes leads to abscess in the parietes and artificial anus. 6. That in the worst cases astringents and opiates are ineffective. 7. That injections and stimulants afford considerable relief, and in mild cases will alone be sufficient; but are inferior in their efficacy to astringents and opium. 8. That rest, even in mild cases, is desirable. Many cases have presented themselves in my own practice and sphere of observation, where these means checked the purging, and restored to health. 9. That, as far as can be judged, mercurial preparations would have been injurious." (p. 259.)

The reader, however, would find it less easy than the author to discover the proof of all this in the ten cases. As respects the treatment of dysentery, while passing in review the several classes of remedies, Dr. Habershon observes that "opium is of almost universal application, but cannot be given indiscriminately." He considers that calomel in moderate doses is often advantageous "in the earliest stages, where the motions are of unhealthy character, pale, or containing hard scybalous masses. He says, "we have no facts to show that the inflammation of the mucous membrane is diminished by its action, but rather that it is increased, and ulceration accelerated." We think that, considering how opposed this view is to that of some medical practitioners, something more than a bare assertion should have been furnished upon this most important subject in a book professing to supply facts from which the reader may form his own opinion.

In the two succeeding chapters, On Typhoid Disease of the Intestine, and On Colic, the author drops his professed method of instruction, and narrates no instances to illustrate his observations.

The thirteenth chapter is On Constipation. There are several assertions in this chapter which we think the author would find some difficulty in proving. Thus:

> "The box of rhubarb pills is often carried by the pedestrian—and why? The muscular exercise and action of the abdominal muscles should induce increased action; and such would in many cases happen if the exercise were moderate; but if persisted in so as to induce free perspiration, with molecular changes in the muscles, blood is actually withdrawn from the alimentary canal to the skin and muscles; the internal secretions become diminished, and constipation results." (p. 300.)

We should have been disposed to lay some stress upon the frequency with which the traveller is balked when the natural call to evacuation occurs, and upon the inconvenience which constantly is apt to arise from an endeavour to obey it regularly. Repeated and inordinate fatigue must also exercise some influence in the matter. We sincerely hope no idle scribbler will feel it is duty to whip the following into the whirl of an anti-snuff controversy:

> "It is, I believe, universally acknowledged that the long-continued habit of taking snuff irritates the fauces and epiglottis, producing cough, &c. Nor is dyspepsia the extent of its ill effects; the irritating particles extend through the whole length of the alimentary canal. Several inveterate snuff-takers have intimated to me the irritable state of the bowels, in whom it appeared that the mucous membrane was unnaturally stimulated and irritable. The oft-repeated stimulus leads to an enfeebled condition of the mucous membrane, a loss of contractile power, of healthy secretion, and of nervous stimulus; as regards the stomach, dyspepsia is the result; in the intestine, diarrhœa or constipation; in some cases the rectum is principally affected, and it either retains the fæces so as to form an impacted mass, which it is unable to propel; or, if fluid, the same feebleness allows the contents to pass rapidly to the sphincter, itself sometimes so enfeebled as to be unable to restrain an involuntary discharge. Snuff may actually be seen among these excreta." (p. 301.)

We do not defend this dirty and useless habit, but as Dr. Habershon produces no instances from which we may form a judgment as to the logic of his inferences, we may say that we think that for every case he may adduce in support of his opinion as to what snuff-taking leads to, we could bring him a dozen inveterate but healthy snuff-takers who do not know what dyspepsia means, who require no more aperient medicine than their neighbours, and whose sphincters are powerful enough to prevent their being by any means a nuisance to society. Such results as are described can only be exceptional.

Chapter XIV. is upon Internal Strangulation, Intussusception, and Carcinoma of the Intestine. It adds nothing to our present knowledge. We certainly feel disappointed that no fresh light is thrown upon the difficulties of diagnosis as to the seat and nature of these obstructions. Case CXXXIV. illustrates the value of the opium treatment.

There succeeds a short chapter On Intestinal Worms. The last chapter is devoted to Perforation of the Intestine from Without, Abscess in the Abdominal Parietes extending into the Intestine, and

Fæcal Abscess. The cases described illustrate some of the circumstances under which such intestinal openings are formed.

We have yet a word to say in the interest of medical literature. We do not expect a medical writer to wield the pen of a Macaulay in detailing the history of disease, but we do require accuracy of expression, and some adherence to grammatical rules. When sentences such as those we are about to quote abound, as they do in the volume before us, it becomes our duty to point them out, and to warn the author against their repetition.

> "These remedies are variously combined in the treatment of disease, sometimes modifying *each other* in their action, or increasing *their* efficiency, or enabling the mucous membrane so to tolerate *them*, that they become absorbed and act with benefit." (p. 8.)
>
> "The rules of diet, the administration of proper and suitable food, *is* one of the most important subjects in diseases of the intestine." (p. 8.)
>
> "If a patient firmly believe that a particular medicine or treatment will do him injury, we shall in all probability find that the symptoms are described as greatly exaggerated thereby, *which* no persuasion can mitigate." (p. 8.)

Will Dr. Habershon point out the antecedent of "which?"

> "In some this had been gradually, in others deglutition had suddenly become impossible." (p. 24.)
>
> "In worms, there *is* pallor, irregular bowels," &c. (p. 181.)
>
> "*The intestines* sometimes become much distended with gas, *and at first sight resemble ascites.*" (p. 181.)
>
> "Or it may be that the peristaltic action is rendered irregular by an irritated condition, from acrid and crude materials impelled into *it*." (p. 203.)

Into what? Into the peristaltic action?

> "In infants a fertile source of diarrhœa, often passing into severe gastro-enteritis, is administration of unsuitable food, *which* is greatly increased by exposure to cold." (p. 238.)

Of course it is the administration of unsuitable food that exposure to cold aggravates. If these errors had been occasional only we should not have noticed them, but we could multiply such quotations as these. They are faults which seriously mar a useful book. We have no doubt that a second edition will be some day called for, and then we would recommend the author to revise every page with care.

REVIEW XII.

An Elementary Course of Botany: Structural, Physiological, and Systematic. By ARTHUR HENFREY, F.R.S., L.S., &c., Professor of Botany, King's College, London, Examiner in Natural Science to the Royal Military Academy and to the Society of Arts. Illustrated by upwards of 500 Woodcuts.—*London*, 1857. pp. 702.

WHAT need is there of more botanical manuals? This is a question which must naturally suggest itself to our scientific friends and medical brethren on first glancing at the above title. An answer is not so readily offered. The mere fact that we are well nigh inundated with works all professing to be more or less elementary, does not necessarily meet the exigencies of the case. The smaller treatises of Jussieu, Balfour, Lindley, and others, have undoubtedly their individual merits, some of them being admirably suited to the scientific student, but, according to our view, we have yet to see produced such an 'outline' as shall, without being too technical and voluminous, abundantly satisfy the requirements of the medical student. Professor Henfrey leads us to assume that his elementary course is designed to meet such a want when he points to the circumstance that those who pursue the subject are for the most part destined to swell the ranks of the medical profession. How far he has succeeded our readers will, we trust, be able to determine by our present notice. Once for all, let it be distinctly understood, that the value of a new manual does not rest so much upon the mere number of individual facts compressed within a certain brief compass, as upon the manner in which a limited series of essential particulars can be most attractively presented to the mind of the young inquirer. Mr. Henfrey correctly states that—

> "A compendious manual of a science makes peculiar demands upon the powers of an author. Originality of matter has little place. The exercise of judgment and conscientiousness in examination of original sources is everywhere demanded; and these are of course most beneficially employed when they rest upon an extensive basis of practical experience." (Preface, p. 5.)

It requires only a superficial perusal of the "elementary course" to perceive how scrupulously careful our author has been to act up to his own honestly-expressed sentiments. So faithful, indeed, is he in respect of the ousting of original matter, that we feel ourselves bound to say he has unnecessarily curtailed that part of the subject in which he is, as an independent observer, pre-eminently distinguished. We allude to the subject of fertilization in phanerogamia. If there be one department of physiological botany more intensely interesting and edifying to the student of medicine than another, it ought to be the subject of vegetable reproduction, for here it is that we have exhibited that remarkable correlation of phenomena which at once opens up to our view the fundamental unity of the reproductive process, throughout the entire range of organic life. The recent researches of Ransom and Bruck in regard to the impregnating act in fishes, and of Meissner in reference to the same function in Nematoidea, have a significant bearing upon this interesting question, and the analogy is still more evident in the lowest phases of animal and vegetable existence.

Taking as a whole that section of the volume (Part 3) exclusively devoted to physiology, we desire to express our unfeigned satisfaction at the judicious manner in which it has been treated; and we thoroughly appreciate the necessity of first directing the student's attention to things which can be dissected and seen with the naked eye, before those minute structures are entered upon which can only be demonstrated with the microscope.

Mr. Henfrey has comparatively little to say on the subject of the cell-nucleus upon which Schleiden and his followers have descended so vigorously. While on the one hand, however, the entire absence of the nucleus in many of the lower Thallophytes and other higher structures shows that cell-growth and formation can proceed independently, its uniform existence in the nascent condition of the cells of by far the majority of plants proves, on the other hand, its great importance in the economy of vegetation, whatever may be the precise nature of its function. We entirely concur in regarding the *primordial utricle* as the absolutely essential element in cell-formation, and as vitally homologous with the animal substance of *protozoa.* Albeit we think Mr. Henfrey has dismissed the consideration of the cytoblast too summarily, notwithstanding that the difficulty in reference to its significance is thus fairly expressed:

> "The original statements of Schleiden regarding the formation of new cells upon or around a nucleus were incorrect; the nucleus always lies under the primordial utricle, on which depend the structural conditions of cell-formation, and never in contact with the cell membrane. But it is quite possible and even probable that the nucleus may have great physiological importance in cell-development, and may constitute the focus, as it were, of the physiological forces of the cell." (p. 509.)

From the almost unqualified approbation above pronounced on the section most important to the student of medicine, our readers will have possibly concluded that the 'elementary course' as regards its utility, is destined to supply the place of other similar works now before the public. We are unwilling to disappoint their expectation in this particular, even to a limited degree; but while we are happy to be able to add, that the first part, devoted to morphology or comparative anatomy, is likewise treated in as succinct and able a manner as the third or physiological section, we are nevertheless compelled to regard the division devoted to systematic botany as far too bulky and complex. It extends over three hundred pages, and may, in point of fact, be looked upon as a kind of epitome of Dr. Lindley's 'Vegetable Kingdom.' Let us not be misunderstood. We do not for a moment accuse our author of plagiarism, merely because he has chosen to treat this part of the course very much after the fashion pursued in the above-mentioned work. By no means. All that we contend is, that the introduction of such a little sub-treatise—for so it may be fairly considered—is uncalled for. Any attempt to enunciate in the briefest manner the characters of two hundred and twenty-five natural orders, a very large proportion of which cannot be of the slightest utility to the medical student, we regard as utterly futile; and we undertake to say that no youth, however precocious his talents, would ever dream of being able to enumerate merely the long names of these families. To set before him such a concatenation of diagnoses and affinities as are here exhibited, is too surely calculated to invite his unmitigated disesteem. Should it not be our endeavour, we repeat, knowing how greatly he is prejudiced against botany, to render the subject as fascinating and instructive as possible? This is only to be accomplished by studying brevity in non-essentials, and comprehensiveness in matters of special importance.

There is a feature extremely common in English compilations of the present day, against which we are disposed to protest very strongly; namely, the employment of woodcuts and descriptions without a sufficiently prominent acknowledgment of the sources from whence such data are obtained. We care not whether a book be recognised as a manual, a treatise, or a class-book. In every case it is due to the parties originating such illustrations or composition, that they receive the credit to which they are legitimately entitled. In the present instance we should have been better satisfied, if at the close of each chapter an extended series of references to standard works and memoirs had been appended; an arrangement which would enable the author to leave out much that is now presented to the reader in an inconveniently condensed form. If asked to refer to any scientific handbook, offering as it were a type for all future manual-compilers, we have the satisfaction of naming Professor Allen Thomson's 'Outlines of Physiology;' and in regard to botany, we cannot refrain from expressing our conviction that the first little work brought out by Dr. Balfour, was executed on a most admirable plan; and were that manual not now rather "behind-hand," we should still consider it the best book to recommend to the professional student.

The three chapters of Mr. Henfrey's volume devoted to geographical and geological botany, are very ably handled, and we are glad to perceive the information there given, carefully referred to its primary source in all instances. Thus, for example, in regard to the theory of successive creation of species, ample justice is awarded to those enlightened men, past and present, who have severally acted as pioneers in one of the most fertile regions of scientific discovery:—

> "Edward Forbes was the first to open this line of inquiry, in a most acute and ingenious essay on the 'Origin of the Existing Flora of Britain.' Dr. Hooker has pursued the same line of reasoning in his inquiries into the 'Botanical Geography of the Southern Hemisphere.' The value of this most legitimate path of inquiry has not yet been fully appreciated by botanists, who have not clearly perceived that the hypotheses rest not merely upon botanico-geographical facts, but upon ascertained data of geology, palæontology, and zoology.' (p. 628.)

We have thus briefly, frankly, and as we trust inoffensively, set forth our candid opinion of the several sections of Professor Henfrey's volume. His writing is throughout characterized by easiness of style and clearness of expression. Although we have taken exception to the manner in which the author has treated one department of the science, we have no hesitation in stating that the 'Elementary Course' bears evidence of being the production of a thorough master of the subject.

PART SECOND.

Bibliographical Record.

Art. I.—1. *On Mineral Waters: their Physical and Medicinal Properties; with Descriptions of the different Mineral Waters of Great Britain and the Continent, and Directions for their Administration.* By Robert Mortimer Glover, M.D., F.R.S.E., Member of the Royal College of Physicians of London; late First-class Civil Surgeon in the Military Hospitals in the East; one of the Metropolitan Inspectors of the Board of Health in the Cholera of 1854, &c. &c.—*London*, 1857. pp. 375.

2. *A Three Weeks' Scamper through the Spas of Germany and Belgium; with an Appendix on the Natural Uses of Mineral Waters.* By Erasmus Wilson, F.R.S.—*London*, 1858. pp. 368.

It becomes more and more necessary for British physicians to familiarize themselves with the characteristics of foreign watering-places and climates. Our countrymen and countrywomen will go abroad in search of health, whether their family doctor recommends it or not; and as these migrations cannot be prevented, it is best that even those who are sceptical with regard to the curative powers of mineral waters should be acquainted with their assumed properties, in order to prevent the possibility of an erroneous application. But when we calculate the large quantities of solids and liquids that are imbibed during a course of the majority of foreign waters; when we consider the influence necessarily exerted upon the economy by the daily submersion of the body in warm or cold water more or less impregnated with alkaline or saline substances, it would appear impossible to remain sceptical as to the influence, for good or for evil, that mineral waters may exert in diseased conditions.

It is the more imperative upon us to ascertain the nature of these influences when we see the routine system commonly followed and insisted upon by the physicians of the Spas. We send a patient whose mucous membranes are all in a state of chronic inflammation to an alkaline spring, feeling assured that its sedative and alterative influence is indicated in his case. A certain number of tumblers of the water taken by mouth, a definite series of baths, are prescribed; the patient improves visibly in health, gets stronger and more vigorous in body and mind as the diseased condition is washed out of him; but by the third or fourth week the body is saturated, and what were tonic influences, because curative, now prove reducing agents, and the patient goes down-hill. It is suggested that an arrest of treatment would be proper. "No," says the bath doctor, "you have not taken the prescribed number of baths; you have yet to drink a hundred tumblers before the crisis will take place." The patient obeys; the good that was done is destroyed; and he often leaves the place in worse health than he had on going to it. We do not assert that such is always the case; but it is right that we should have some guarantee against our patients becoming the victims of routine treatment, and we cannot secure that result better than by making ourselves well acquainted with the physical properties, and physiological and therapeutic influences, exerted by the different waters of this and other countries, so that we may lay down some general rules for the guidance of our patients before they leave home.

The book which stands first on our list is one to which we may safely turn for information. Written in an agreeable style, the author passes successively in review the mineral waters of England and the Continent, concluding with an examination of the general therapeutic indications that may guide us in the selection of the baths suitable for individual maladies. The author derives his knowledge of the places he speaks of, partly from personal examination—a task for which his abilities as a chemist peculiarly suited him—partly it is based upon the authority of well-known recent and older writers. Throughout we are impressed with the good sense of the practical physician, who is guided by correct pathological and therapeutic principles, so that we refer the sceptic to the book for reasonable grounds why he should alter his views, while we direct the believer in mineral waters to it for a sound exposition of what is known on the subject at the present day.

The character of the second work at the head of this article is essentially what its title implies. Mr. Wilson is an illustration of the proverb, that he who runs may read, while the book before us proves that the runner may write as well.

The description of a scamper, to be true and life-like, should be in rather a "fast" style; and accordingly, though Mr. Wilson gives us much solid information on the contents and qualities of the various springs which he has visited, and of several which he has only read about, he carries his reader along with him, and shows him how a three weeks' holiday may be most profitably and agreeably employed.

The geological knowledge of the author enables him throughout his descriptions to give a running commentary on the influences to which the formation of the country through which he passed, and the origin of the various mineral waters, are due. This and the racy and good-humoured character of the pencillings will doubtless make the book a frequent companion of our countrymen who are about to quit the fogs of London for the brighter atmosphere of Rhineland. An instance or two will best convey a definite impression of Mr. Wilson's mode of handling his subject:

> "One of the eccentricities of hotel life on the Continent, and, for aught I know, it may be the same in Great Britain, is that of naming the guests

according to the number of their apartment; thus, at Wiesbaden, I was *numero ein und neunzig;* at another place I was *numero drei;* and in a third, *numero vier und zwanzig.* This is all very well if you remain for a certain time in one place; but if you move about rapidly, as was my case, it is sometimes puzzling to answer the waiter's question of who you are—in other words, what is your number. It was my custom, as I hope it may be that of my reader, to be satisfied with a half-bottle of wine with my dinner; and early in my continental career I had given the usual order to the waiter. 'A half-bottle of wine for *numero drei*' (pronounced dry), said he, to the butler as he passed the order. Numero *dry*, thought I to myself, these fellows must be cutting a joke at my expense; I ought to have ordered a bottle instead of a half-bottle, for half a bottle for a numero *dry* seems a very insufficient quantity; but my sobriety was happily preserved by the sudden remembrance that *numero drei* was for the moment my *nom d'appartement*, if not my *nom de guerre.*"

The following is a hint for the psychologist. The scamper has for the nonce subsided into a quiet walk up and down the parade at Wiesbaden, and the doctor scans the different votaries of Hygeia:

"Here is a specimen of liver in a fix; there is a stomach in hysterics; ah! case of pulmonary congestion, no doubt; anæmia! why, what does she do here? Here is our friend chronic rheumatism; that is, no doubt, neuralgia; and here our enemy, the gout. I walked up to the counter, whence the young ladies behind the bar distributed their aqueous riches, and politely asked for a glass. Ah! not very clear, but smoking; saltish, yes; very like beef-broth, yes;—that's the stuff. I must admit that if the question, agreeable or disagreeable, were put to me upon mine honour, I should say *agreeable.* How curious is the instinct of warm and cold in drinks; there are some hardly endurable cold, which are not unpleasant warm, and salt fluids are of this kind. A lady near me was making a great variety of wry faces at her dose, which her husband was persuading her to swallow. 'But it is really not unpleasant,' said I, 'it is very like bouillon,' sipping it again. She looked at me with a little amazement, and then, as if to illustrate that argument is better than force, she drank it all off, as though the thought of it not being disagreeable, had never occurred to her before."

ART. II.—*A Sketch of the Principles and Practice of Subcutaneous Surgery.* Being the Oration delivered before the Medical Society of London at their Eighty-fourth Anniversary, March 9th, 1857. By WILLIAM ADAMS, F.R.C.S., Surgeon to the Royal Orthopædic Hospital, Lecturer on Surgery at the Grosvenor-place School of Medicine, &c. Published at the request of the Society.—*London,* 1857. pp. 67.

IT is commonly but a poor compliment to the author of an annual oration to add to the vote of thanks, to which he is generally most justly entitled, the unanimous request that he will publish his address. If he rashly consents, the only satisfaction that commonly results is that involved in the expenditure of from five to ten pounds; the five hundred copies that were struck off, are circulated at the additional cost of so many postage labels, and they are then consigned to the tender mercies of the cook and the housemaid. Such, poor orators, is indeed the too common fate of your productions. We do not, however, anticipate that this will be the treatment of the thin volume of which we give the title above; it appears to us not so much a compliment to Mr. Adams, as an act of justice to the profession, that this excellent sketch of the principles and practice of subcutaneous surgery should receive a wide circulation.

With this praise we must couple a demurrer to the introductory observations of the author. Whether or not John Hunter was *the first* to point out the prejudicial influence exerted upon a wounded surface by the atmosphere, he certainly does not deserve the merit of being the inventor of subcutaneous surgery. It might as well be said that because Cadmus introduced the use of letters into Greece, he had a part in the Antigone. As little can we agree to the decision of Mr. Adams that the priority of establishing the principle of subcutaneous surgery belongs to M. Guerin. Delpech might perhaps put in a claim, but to Stromeyer undoubtedly belongs the honour of being the *bonâ fide* author of subcutaneous tenotomy.[*]

Mr. Adams passes in review the various operations which may be performed subcutaneously, and classifies them in a logical and judicious manner; under the first head he considers operations done with the sole object of avoiding inflammation and its consequences, which would necessarily ensue if they were performed by open wounds; under the second, those in which, in addition to the intention just adverted to, the surgeon desires to obtain a new connective tissue between the divided parts; the third class comprises those operations performed with the view of avoiding excessive inflammation, where the inflammation cannot altogether be avoided; the fourth class includes the operations performed with the view to producing a little, but avoiding excessive, inflammatory action; and the fifth class of subcutaneous operations has the object of arresting the inflammatory process, or of averting some of its troublesome or unfavourable consequences. The illustrative instances of each of these classes are well chosen. The appendix contains some interesting experiments performed conjointly by Mr. Adams and Dr. Snow, on the comparative influence of various gases upon the abraded surface; together with other matter bearing upon the very interesting topics discussed in the body of the work.

ART. III.—*Life, its Nature, Varieties, and Phenomena.* By LEO H. GRINDON, Lecturer on Botany at the Royal School of Medicine, Manchester. Second Edition, improved and considerably enlarged. *London*, 1857. pp. 405.

To revel in the spiritual interpretations of material objects and to dwell upon the analogies which the poetic mind can trace between the physical and the immaterial world, is one of the greatest luxuries reserved for the refined and educated mind in the intervals of daily labour. Such a banquet is spread for us by the author of the book before us. It has to us been truly a "physician's holiday" to peruse it; and though we have in the fuller criticism which we devoted to the work a year ago, expressed some dissent from the author's arguments and reasonings, we cannot but urge upon all who are not afraid to submit themselves to the fascinations of the talented author, to follow our example, and grant some hours from the sterner demands of reality to the dream-like enchantment of his "winged words."

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[*] Stromeyer, in his Beiträge zur Operativen Orthopädik (Hannover, 1838), distinctly claims this honour, at a time when Guerin was not heard of, in the following words:—"Es ist mir deshalb die Ehre zugefallen diese Heilmethode [viz., subcutaneous tenotomy] in die Chirurgie der gebildeten Nationen einzuführen." Stromeyer's first essay on the subject appeared five years earlier, in Rust's Magazin, Band xxxix., p. 195, 1833, and is reprinted in the Beiträge.

The second edition, which we now specially introduce to our readers, embodies the notes, which in the former one were placed at the end of the book, and contains other additions which enhance its value.

Art. IV.—*Fiske Fund Prize Essays.—The Effects of Climate on Tuberculous Disease.* By Edwin Lee, F.R.C.S. Lond. Being the Dissertation to which the Fiske Fund Prize was awarded, June 6th, 1855.*—*The Influence of Pregnancy on the Development of Tubercles.* By Edward Warren, M.D., of Edenton, N.C. Being the Dissertation to which the Fiske Fund Prize was awarded, June 4th, 1856.—*Philadelphia*, 1857. pp. 73. pp. 42.

These essays have already appeared in the 'American Journal for Medical Sciences,'† but are republished by the trustees of the Fiske Fund Prize in a separate form, because, as the preface informs us, they are "connected by the topics discussed, and present a large amount of information on one of the most interesting and difficult subjects of medical science."

Had the trustees limited themselves to the publication of Mr. Lee's essay, we should be disposed to accord entirely with the propriety of the act; but we cannot but think that they would have consulted their own dignity and the interests of medical science by allowing the essay of Dr. Warren to remain unpublished; and, if our view of its merits be correct, *à fortiori*, not to have awarded to it the prize.

Mr. Lee judiciously examines into the evidence connected with the question of the influence of climate upon the treatment of pulmonary tubercle, and in doing so brings to bear a large amount of practical knowledge, which he has acquired on the subject, by extensive travel and personal inquiry. The basis upon which his conclusions rest is mainly contained in the following just statement:

> "Statistical documents, as well as the investigations of impartial observers, have shown that pulmonary consumption occurs much more frequently than elsewhere in countries and localities where a humid state of the atmosphere predominates, and also that it prevails chiefly among those classes of the population who are most exposed to this and other influences which tend to depress the vital powers—particularly the activity of the capillary circulation—and consequently to vitiate the blood by suppressing the cutaneous transpiration."‡

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* An English edition of Mr. Lee's essay has been recently published in London, with considerable additions.

† April and July, 1857.

‡ English Edition, p. 115.

The author goes on to observe that consumption is comparatively rare in cold and dry, as well as in warm and dry, climates, and that

> "The chief indications for the treatment of pulmonary tuberculisation by climate are—first, to remedy as far as possible the morbid condition of the blood, which constitutes the cachetic state; and secondly, to allay the general and local excitation occasioned by the organic lesion."*

The selection of a warm and dry climate during the winter is generally one of the chief points to be attended to, it being desirable to enable the patient to be in the open air as much as possible, and by exercise to promote that healthful cutaneous transpiration and elimination of waste material which is the best preservation against the incursions of tubercle. It is important to remember that

> "A prolonged residence in any place where the temperature is very equable and the atmosphere calm, is not advantageous to most patients when the chief object is to procure the restoration of the blood to its normal state. On the contrary, a moderate agitation of the atmosphere is favourable to them by increasing the insensible perspiration, and by making them, so to speak, breathe by the skin as well as by the lungs."†

The choice of the climate in the individual case must depend upon the peculiar habit of the patient. Where the circulation and the whole type of the disease are languid, we should select a stimulating and bracing locality; where, on the contrary, we have to deal with an excitable individual of the florid or sanguineous class, a sedative climate should be chosen. Mr. Lee's conclusions with regard to the individual localities abroad most commonly resorted to by invalids, are contained in the following paragraph:

> "Among the foreign climates most in repute for their efficacy in retarding the progress of pulmonary consumption, there exists a considerable variety, with respect to equability of temperature, the state of dryness or moisture of the atmosphere, the degree of warmth, &c. The climates of Upper Egypt and the south-eastern coast of Spain, are the most remarkable for their warmth and equability in winter, as well as for the dryness of their atmosphere. To these climates, Hyères, Nice, Menton, Malta, and Naples approximate nearest as regards dryness, though differing materially in other respects. The West India Islands and Cuba may be mentioned as a type of hot and moist climate. Among the intermediate climates, characterized by variable degrees of warmth, equability, and humidity, are Madeira, Algiers, Pisa, Pau, Rome. The two latter have a sedative action, often depressing the vital powers of persons in health, as well as of many invalids."‡

In the Appendix to the English Edition, Mr. Lee successfully combats the doctrine promulgated by M. Rochard, that sea air and sea voyages are productive or promotive of pulmonary phthisis. For the details of his arguments and facts, however, we must refer our readers to the book itself, which they will not fail to peruse with interest and instruction.

We much regret that we cannot pronounce as favourably upon the result of Dr. Warren's labours. They show considerable literary research, but the loose manner in which quotations are brought together, the frequently illogical character of the inferences which are drawn, and the want of all original observation on the part of the author, fully justify our verdict. A few samples of the author's mode of handling the subject will suffice to convince our readers that our strictures are well grounded. After adverting to the experiments of Bernard and others, on the functions of the pancreatic fluid, showing the digestion of fatty matters to be the peculiar office of the pancreas, without further preface we are told:

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* English edition, p. 116. † Ibid., p. 117. ‡ Ibid., p. 120.

> "In tubercular cachexia, this digestion of fatty matter is prevented, and hence the demand upon the tissues for the oleaginous materials deposited in them, and the general emaciation which immediately results to the patient."

Again, having settled that authorities, from Hippocrates downwards, all, with two exceptions, pronounce consumption to be hereditary, he remarks: "The very fact that phthisis is a hereditary affection, is *primâ facie* evidence that its origin can be traced to the nerves." Apart from the peculiarity of the conclusion itself, there is to us a difficulty in reconciling the nervous with the pancreatic origin of phthisis, so strongly urged just before.

Again, in speaking of the use of tonics in the treatment of phthisis, we are told that

> "They stimulate gently, but effectually, the nervous centres, so that an increased amount of nervous force is generated and transmitted to various organs, and in that manner conduce to the health and harmony of the whole system. This explanation of the action of these remedies is universally admitted, and it is unnecessary to inquire further into its truth."

There is not a page in the treatise which does not contain some inconsistency, but we shall confine ourselves to one more extract, which, equally with the rest, serves to confirm our opinion, while it contains the pith of the whole matter. After remarking that the relative mortality of the two sexes from phthisis is not finally determined, and that the conclusions of Louis and Laennec as to the greater liability of females than males may be doubted, Mr. Warren states that

> "In many thousands of instances, at least, a great protecting principle has manifested itself in connexion with the female system, and it is evident that without some such conservative influence, the number of women who die of consumption would far exceed that of men, for the reason that their physical conformation, mental qualities, moral character, and natural habits render them particularly susceptible to the action of those causes whereby phthisis is produced. That this immunity and protection are due to the effects of utero-gestation is evident from the following considerations:—1. Pregnancy, as shown before, produces a condition of antagonism in the economy. 2. Pregnancy is a vital process, a high physiological act, and hence its existence is incompatible with the progress and perfection of a purely morbid effort. 3. Pregnancy diverts the forces and fluids *from* the lungs and *to* the uterus. 4. Pregnancy is regarded by a large majority of medical men as antagonistic to the march of consumption. 5. Pregnancy depends upon the existence of certain susceptibilities which are inherent in the female system, and hence it is more *universal* in its operation than any other imaginable cause. 6. Pregnancy, coition, &c., are particularly desired by women affected with phthisis, which constitutes a *pointing* of *nature** towards a *remedy* for the evils by which the system has been invaded."

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* The italics are the author's.

We must apologize to our readers for presenting them even with so small a specimen of the author's mode of arguing upon physiological and pathological facts; but as Dr. Warren's essay has secured the approval of the Rhode Island Medical Society, it is invested with an importance which we should otherwise not have attributed to it. The last quotation sufficiently indicates the mode in which the author handles his subject, and the general drift of his argument. But we can only say that if such reasoning, such a confusion of all logical principles, is to pass current in medical literature, it is no wonder, indeed, that the lay public support the various pathies which we are always complaining of as the sharp thorns in our side. Our remarks are directed rather to the gentlemen whose decision has given a fictitious rank to the essay, than to the author himself, whose intentions are evidently good.

ART. V.—*On Cough, its Causes, Varieties, and Treatment. With some Practical Remarks on the Use of the Stethoscope as an Aid to Diagnosis.* By ROBERT HUNTER SEMPLE, Member of the Royal College of Physicians of London, Physician to the Northern Dispensary, Assistant Medical Examiner to the Standard Life Assurance Society, Member of the Court of Examiners of the Society of Apothecaries of London, Member of the Medical and Pathological Societies of London.—*London*, 1858. pp. 174.

THE various forms of cough, their pathology, and the therapeutic proceedings indicated in each, are concisely and lucidly discussed in the little book of which the above is the title. It bears an essentially practical character; the author's views are in accordance with the prevalent doctrines of the day, while his suggestions as to the treatment to be pursued in the individual cases are manifestly derived from the results of careful personal observation.

ART. VI.—*A Popular Treatise on the Causes and Prevention of Diseases.* By SAMUEL FENWICK, M.D., Lecturer on Pathological Anatomy at the Newcastle College of Medicine. Vol. I. *Diseases of the Throat and Lungs.*—*London*, 1857. pp. 220.

IT is only by long experience, combined with sagacity, and matured by reflection, that the true nature of disease can be appreciated, and appropriate remedies prescribed; while the foundations on which medicine is based—as Anatomy, Physiology, Chemistry, and Pharmacology—might themselves occupy a lifetime for their due and complete study. Hence we always regard with distrust, if not with disapprobation, the attempts which from time to time have been made to bring the study of medicine down to the meanest capacity by short and familiar expositions of symptoms, maladies, and remedies; as it appears to us that such books are written rather to promote personal objects on the part of the authors than to contribute to the public good.

But we must, in justice to Dr. Fenwick, acknowledge that the volume which he has written does not belong to this class, and that, as far as we can judge from the portion of his task which he has already accomplished, his treatise may prove serviceable to the community. He has entirely, and we think very properly, avoided any allusion to the special treatment of disease; but he has given many wholesome directions to guide the public in its prevention. The masses are still too little aware of the importance of Preventive Medicine, and vulgar prejudice still eagerly seeks for drugs or other remedies to arrest the progress of a fever or an inflammation, when the knowledge of the sources of disease might have obviated its appearance altogether. Nearly half of Dr. Fenwick's volume is occupied by the subject of Consumption and Scrofula; and it will be obvious, after the remarks we have just offered, that it was no part of the plan of the work to offer any new views, or to enter upon any recondite arguments as to the pathology or treatment of this very common and too fatal form of cachexia. We have, therefore, no description of the chemical or microscopical character of tubercle; we have no discussion as to the value and meaning of the various auscultatory sounds observed during the progress of the disease; and the therapeutical indications are not alluded to at all. But the causes of Scrofula and Consumption, so far as they have yet been ascertained, are clearly and fully pointed out, and the modes by which the progress of the disease may be checked are detailed with equal clearness.

While thus giving commendation to its plan and execution, we question the propriety or the utility of many of the illustrations which are introduced among the letter-press. The plates are copied, without acknowledgment, from 'Wilson's Anatomy' and other well-known works, and are of course unnecessary for the information of the profession, while they are insufficient to make anatomists of the general public, for whom the book is avowedly written.

ART. VII.—*Traité Pratique des Maladies de l'Œil.* Par W. MACKENZIE, &c. &c. Quatrième Édition. Traduite de l'Anglais et augmentée de Notes par le Dr. E. WARLOMONT et A. TESTELIN, D.M.P. Tome premier.—*Paris* et *Bruxelles*, 1856 (pp. 862). Tome second, 1857 (pp. 900).

Practical Treatise on Diseases of the Eye. By W. MACKENZIE, &c. &c. Fourth Edition. Translated from the English, and enlarged with Notes. By Dr. E. WARLOMONT and A. TESTELIN, D.M.P. 2 vols.

NOT only have MM. Testelin and Warlomont in the work before us produced a faithful version of Dr. Mackenzie's treatise, but they have enriched it with supplementary chapters on various subjects which they considered to have been too briefly treated by the author. Indeed, the remarks on "congenital abnormities" prefixed to each section by Cornaz, seventy pages on the "Ophthalmoscope" by Liebreich, and nearly one hundred pages on "Purulent Ophthalmia" by the translators themselves, might fairly have been printed as so many independent works. MM. Testelin and Warlomont considered it their first duty to reproduce with the utmost fidelity the exact meaning of their original, and not until that object had been attained did they attend to the graces of style; but no one familiar with French can fail to be struck with the general elegance which pervades the whole work, and many passages which in the original English are somewhat involved and obscure, appear in all that neatness and precision of language which characterizes French when really well written. Anxious to ensure all possible correctness, Dr. Warlomont availed himself of the friendly offer of Mr. Dixon to read over the proofs. Each sheet of the translation was therefore forwarded to London, and was not printed off until Mr. Dixon had verified its correctness.

The present is not the first French version of Dr. Mackenzie's treatise. MM. Laugier and Richelot published one several years ago; but they wholly omitted the bibliographical references, and Dr. Mackenzie, in the preface to his fourth edition, very justly complains of this conduct, as unfair both to him and to the numerous authors whom he had quoted with so much care and labour. MM. Testelin and Warlomont have not only carefully preserved all Dr. Mackenzie's references, but have considerably added to their number. The second volume closes with a copious index, and, in short, no trouble has been spared to make this French translation the fullest and most comprehensive work of reference on ophthalmic medicine and surgery.

We cannot dismiss this really arduous undertaking of MM. Testelin and Warlomont, extending to no less than seventeen hundred and fifty-two pages, without expressing our admiration of the manner in which the work is "got up." The woodcuts are far better printed than they were in the English original, the type is handsomer, and the paper finer. Such books do honour to the Brussels press, and are all the more gratifying when we remember that only a few years ago the Belgian press was a by-word throughout Europe for its shameless piracies. An international treaty has put an end to this fraudulent system, and we hail these handsome volumes as an example of what the legitimate exercise of Belgian industry and taste can accomplish.

ART. VIII.—*The Testimony of Nature to the Identity between the Bud and the Seed.* By ALEXANDER HARVEY, M.D., formerly Lecturer, some time on the Institutes, and afterwards on the Practice of Medicine, in the University of Aberdeen.—*London*, 1857. 8vo, pp. 70.

IN a little work published last year, entitled 'Trees and their Nature, or the Bud and its Attributes,'[*] Dr. Harvey brought forward a number of ingenious arguments in favour of a theory now generally received, that a tree is not to be considered a "single or individual plant," but rather as "a congregation of individual plants of the same species." In the present publication, he carries these views still further, and endeavours to prove that the buds, which constitute the component individuals of the composite tree, are identical with the seeds. This leads him to deny the recognised axiom of physiology, that for the reproduction of a living being, the union of reproductive germs from two distinct individuals is required, and he brings forward the following arguments in his support:—

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[*] See British and Foreign Medico-Chirurgical Review, vol. xvii. p. 448.

[†] Ibid., Oct. 1857, p. 485.

1. The development of asexual, unicellular plants and animals.
2. The "immortality" of trees, which, he thinks, demonstrates, that the successive formation of buds is a true reproduction of the species, and not a process of nutrition; all nutritive processes being of "temporary duration only."
3. The recent observations of Von Siebold, with regard to the honey bee,† that the drones are produced from the queen mother, independently of impregnation.

Without wishing to attribute to the author any defect in his judgment (which he threatens to accuse himself of, should he not succeed in convincing Dr. Carpenter), we do think he has stretched his argument a little too far, and that although he shows very strong *analogies* to exist between the bud and seed, he has quite failed in establishing their *identity*. While we admit that a tree may with propriety be regarded as a composite being, we are not prepared to admit that the processes or the results of the propagation by buds and by seeds are identical. Take, for example, an instance quoted by the author himself —the potato. It can be propagated both by buds and by seeds, but how different the results of the two processes! By the latter process the *species* is propagated, but by the former, only the peculiarities of the *individual*. Then, again, the author is hardly warranted in dispensing with the necessity of two reproductive germs in the higher orders of nature from what takes place in such beings as the *Monads* and *Protococcus nivalis*, in which all the processes of nutrition and reproduction are reduced to a simple act of cell growth.

Neither does he derive much support to his views from the bee, when he finds it necessary for his argument to transform the queen into a male, from whom the drones are developed as buds:—"She is a female, however, in form only, not in reality;" and "is in fact a male, in a higher sense than even the drone!" Taking for granted that the queen bee can produce drones, independently of impregnation, the fact can only be regarded as an exception to the general law that two germs are necessary for the reproduction of the species of both animals and vegetables.

Dr. Harvey extends his arguments even to the human species. The male he considers the "real reproducer" of the species; and although for the production of a fertile ovum, both a sperm cell and a germ cell are essential, yet this is only for "special ends"—viz., for the purpose of "*social intercourse*," and that the rearing of offspring should devolve on one division of the species, "in order that the other may more freely accomplish the main object of its existence!" We are almost surprised that the author has not attempted to strengthen his view by alluding to the origin of our common mother, who, according to his view, might be regarded as having been an offspring by gemmation, or a bud, from the side of Adam!

ART. IX.—1. *A Handbook of Chemical Manipulation.* By C. GREVILLE WILLIAMS, Lecturer on Chemistry in the Normal College, Swansea, &c.—*London*, 1857. pp. 580.

2. *A Manual of Qualitative Analysis.* By R. GALLOWAY, F.C.S., Professor of Practical Chemistry in the Museum of Irish Industry. —*London*, 1858. Second Edition. pp. 197.

3. *An Introduction to Practical Chemistry, including Analysis.* By JOHN E. BOWMAN, F.C.S. Edited by C. L. BLOXAM, Prof. of Practical Chemistry in King's College, &c.—*London*, 1858. Third Edition. pp. 288.

THE first guide-book in the above list treats of chemical manipulation—a highly important matter. It will usually be found that a skilful chemist is an expert manipulator. Accordingly, it behoves every one who would become an adept in the science to make himself familiar with those appliances which are indispensable to chemical investigation. Mr. Williams's handbook is very creditable to its author. It is well-timed, as the only book in our language specially devoted to chemical manipulation has been for some time out of print. It will, we have no hesitation in saying, prove of utility, not to the student only, but to the more matured chemist. The author is evidently well versed in the subject. The directions which he gives are clear and explicit, as are also his descriptions of some of the complex apparatus used by modern chemists in their elaborate researches, more especially as regards the measurement of high temperatures and the analysis of gases. Mr. Williams has, moreover, been at pains to collect and delineate numerous ingenious contrivances which have been resorted to by distinguished professors of the art. He has devoted considerable space to the details of certain reactions employed in experimental inquiries, all valuable in their way. The work is illustrated with upwards of 400 wood engravings, which are well executed, and well adapted to elucidate the meaning of the writer.

The author sets out by describing in full the most suitable mode of fitting-up a laboratory of research; this is followed by an account of the different furnaces and lamps which may be employed with advantage. The next fifty pages are devoted to blowpipe apparatus, baths, heat-measurers, operations preparatory to weighing, and the balance. In the ninth section, where the subject of specific gravity is discussed, ample directions are given for determining the densities of solid, fluid, and aëriform bodies. Under the head of "Solution," p. 112, the author refers to the uses of the various fluids in the order of the frequency of application; "water, acids, alcohol, ether, alkaline solutions, wood-spirit or methylic alcohol, benzole, chloroform, and turpentine;" giving a few instances of the circumstances in which each of these liquids are applied. There are some useful hints in reference to precipitation, depending on the electro-chemical relations of metals:

"If a solution of cadmium be placed in a platinum crucible with a piece of zinc immersed in the fluid, the whole of the former metal is deposited on the platinum, and after washing, which may be performed without fear of removing the coating, the pure cadmium may be dissolved in nitric acid.

> "When chloride or bromide of silver is fused in porcelain capsules in the process for estimating hydrochloric or hydrobromic acids, it becomes so strongly attached, that it is generally unsafe to attempt its removal by mechanical means; but if a piece of zinc be placed in the capsule touching the fused mass, and a little hydrochloric acid added, it may, after a few minutes, be removed with facility." (p. 130.)

Filtration and washing of precipitates, supports for apparatus, disintegration, crucibles, pressure-tube operations, evaporation, distillation, sublimation, crystallization, are all fully discussed. Under the head of "Volumetric Manipulation," the instruments of Gay-Lussac, Mohr, and Bink are described. Gas manipulation, that connected with organic analysis, glass-working, as also electrical and galvanic manipulation, are all duly brought under notice. Numerous tables are placed at the end of the work, which enhance its usefulness.

Mr. Galloway's volume professes to be a mere introduction to the study of analysis, his aim being "to furnish a suitable guide to the beginner." We have no doubt that a diligent student, by following out practically the instructions of the author, will become acquainted with the chemical properties of the various bodies noticed in the work. The author conveys his information in an intelligible manner, and here and there introduces quotations from the writings of Chapman, Will, Fresenius, Fleitmann, and other chemists. Thus, at p. 151, he observes:

> "The best method of detecting iodine in a solution is to mix with the liquid a little starch paste, and acidify it with HCl. A solution of nitr*ite* of potash is then to be added, when, if much iodine be present, a dark blue will be instantly produced; if a very small quantity only—as, for instance, the two or three millionth part—then a few seconds elapse before the blue colour makes its appearance. Dr. D. Price, who invented this method, states that he has in this way detected the 4,000,000th part of iodine dissolved in water as iodide of potassium. It is, he says, much more delicate than the other tests for iodides, as well as being free from the disadvantages to which they are more or less subject. If the experiment is made in a porcelain basin, the faintest indication of colour may be observed."

The work of Mr. Bowman, now edited by Mr. Bloxam, is similar in character to the preceding, but contains more matter, and is illustrated with about one hundred small wood engravings. The first part is chiefly devoted to chemical manipulation; the second, to the action of reagents on bases and acids; the third, to qualitative analysis; the fourth, about twenty-nine pages, to quantitative analysis; the fifth, to reagents. Some useful tables, and a glossary of chemical terms, are appended. It appears to be a careful compilation.

ART. X.—*The Uræmic Convulsions of Pregnancy, Parturition, and Childbed.* By Dr. CARL R. BRAUN, Professor of Midwifery, Vienna. Translated from the German, with Notes by J. MATTHEWS DUNCAN, F.R.C.P.E., Lecturer on Midwifery, &c.—*Edinburgh*, 1857.

THIS volume is the translation of a single chapter of Dr. Braun's new text-book of midwifery. The subject is one of such deep and extensive interest that a complete *résumé* and appreciation of the current knowledge regarding it was greatly needed by the scientific practitioner and the student.

Dr. Braun sets out by defining or isolating "uræmic" convulsions from other forms of eclampsia parturientium—a very necessary course, for much confusion exists, in consequence of the prevalent habit of looking upon all forms of convulsions in childbed as constituting a nosological unity.

After an enumeration of the causes that may produce, or the conditions that have been observed to be associated with, convulsions, Dr. Braun admits that the most different causes may, during the period of pregnancy, as well as out of it, produce phenomena closely resembling those of uræmic eclampsia; but he thinks he is entitled to maintain that, as a rule, eclampsia *vera* puerperalis is found intimately connected with diabetes albuminosus. But this, it will be instantly perceived, is merely tantamount to an arbitrary exclusion from his definition of true puerperal convulsions—of every kind of convulsion that is not associated with uræmia. The result of Dr. Braun's limited definition is a treatise—a valuable one, it is true—but still a treatise on *one* form of eclampsia only; the rest being disregarded, however worthy some of them undoubtedly are of the most critical examination.

After describing the symptomatic phenomena of the fit, and having referred to the almost universal presence of œdema, Dr. Braun observes that only those œdemata of pregnant women which exist contemporaneously with albumen, fibrin cylinders, and fatty degenerated scales of Bellini's epithelium in the urine, have a connexion with uræmic eclampsia. In Chapter II. the pathogenesis of the disease is discussed. The author believes the cause of the convulsions to be the circulation of urea in the blood, which the diseased kidney will not eliminate. Braun adopts the conclusion of Frerichs, which is, that the convulsions arise from the transformation of the urea in the blood into carbonate of ammonia, under the influence of some peculiar ferment. If this ferment be wanting, the mere presence of urea causes no convulsion.

In Chapter III. the connexion between eclampsia and the pains of labour is considered. Dr. Braun agrees with the general opinion that the pains are rather the consequence than the cause of the convulsions. The influence of the eclampsia on the life of the fœtus is a subject briefly summed up. The mortality of children during the fits and during delivery amounts to ·45. During the period immediately following delivery, the mortality is ·40 among those born at the full time, and ·64 among the premature. We find an interesting note by Dr. Matthews Duncan referring to a case of a child born of a woman suffering from albuminuria, which, when above a year old, suffered at the same time from laryngismus and albuminuria.

Dr. Braun negatives the theory which assigns congestion of the kidneys resulting from pressure as the sole cause. Indeed, it is difficult to conceive how any unprejudiced observer can hold this opinion in the face of the fact that uræmia and eclampsia not unfrequently occur in the third and fourth months of pregnancy. The author devotes an excellent chapter to the pathological anatomy of the disease. The proof of the intimate connexion between eclampsia and uræmia is the subject of an elaborate chapter.

In reference to treatment, Dr. Braun expresses himself decidedly adverse to depletion. He says that "a general depletion of blood in uræmic eclampsia had very seldom any valuable effect on symptoms, and generally produces irreparable injury." We must, however, join in the opinion expressed by Dr. Duncan in a note, that the old treatment by bleeding is not so absurd as it is now often called. Our own experience is certainly favourable to bleeding, not *ad libitum*, but with discretion; nor can we reproach ourselves with having inflicted "irreparable injury" on the patient by the practice, unless it be an irreparable injury to recover. Dr. Braun concurs in the opinion that speedy delivery is desirable. Discountenancing bleeding, he advises large doses of opium and cold affusion. It appears to us, viewing the pathology of the disease and of the fit, that opium is calculated, by increasing the tendency to narcotism, to aggravate the case.

In concluding this notice, however, we feel it a duty to express a very high opinion of the literary merits of the work, and to tender our thanks to Dr. Matthews Duncan for the pains he has taken in introducing it to the English reader.

ART. XI.—*Summary of New Publications.*

AMONG the large number of more or less important works issued during the past quarter, to which we shall take a future occasion to advert more particularly, Dr. Richardson's Prize Essay 'On the Coagulation of the Blood' claims the first mention; physiology is further represented by a Catechism of the science, of which Mr. Wharton Jones is the author, and by the first volume of Dr. Brown-Séquard's 'Journal de la Physiologie de l'Homme et des Animaux.' Surgery brings us an important illustrated work by Mr. Maclise 'On Dislocations and Fractures;' a volume by Mr. Holthouse 'On Squinting,' in which the subcutaneous method of operation is specially advocated; and an account of Portuguese ophthalmology by Dr. Marques. The pathology of the articular cartilages is discussed by Mr. Bryant, while that of gleet finds an expositor in Dr. Dick. Two large illustrated works on midwifery have reached us from the United States—the one a translation by Dr. Bullock of M. Cazeaux' theoretical and practical treatise on the subject; the other, an original work 'On the Principles and Practice of Obstetrics, by Dr. Henry Miller. Dr. Waller presents us with a fourth edition of his 'Elements of Practical Midwifery;' a re-publication of Dr. Barnes's well-known lectures 'On the Physiology and Treatment of Placenta Prævia,' which originally appeared in the 'Lancet,' belongs to the same category, as well as Dr. Lee's treatise 'On the Employment of the Speculum.'

The most numerous accessions to professional literature have been in the department of Medicine, *sensu strictiore;* though a mere glance suffices to prove them of very varying quality. Second and third editions respectively are issued of Dr. Churchill's and Dr. Forsyth Meigs's works on the diseases of children; clinical medicine finds an exponent in Professor Naumann's 'Ergebnisse und Studien aus der Medicinischen Klinik zu Bonn;' epilepsy is critically and experimentally analysed by Dr. Brown-Séquard, while Dr. Davey presents us with a treatise on the ganglionic nervous system, and 'Some of the more Obscure Forms of Nervous Affections' are discussed by Mr. Lobb. Dr. Lionel Beale's 'Illustrations of the Constituents of the Urine, Urinary Deposits and Calculi,' are now collected into one volume; the literature of rheumatism and gout is increased by a work of Dr. Alexander on these twin diseases; Mr. Nourse is not afraid to approach an equally trite subject—Cholera. Much labour has been bestowed by Dr. Peacock on the malformations of the heart, and he offers us a record of very interesting cases chiefly observed by himself; the accompanying illustrations aid in rendering this an important contribution to cardiac pathology. Anatomy, physiology, and pathology, are conjointly represented in Dr. Peaslee's volume on Histology.

Numerous Reports from the various Officers of Health testify to the zeal with which these gentlemen are prosecuting their beneficial labours. With these we would mention Mr. Rumsey's address 'On Sanitary Legislation and Administration in England,' Dr. Greenhow's paper 'On the Study of Epidemic Disease,' and Dr. Mühry's profound climatological work, entitled 'Climatologische Untersuchungen.'

In Psychological Medicine we have to advert, in addition to the numerous reports of asylums and periodical literature on the subject in England and America, to 'The Medical and Legal Relations of Madness,' by Dr. Joshua Burgess. The first part of the second volume of the 'Midland Journal,' the January number of the 'Liverpool Medico-Chirurgical Journal,' are before us; and our attention is also called to the first number of the 'Atlantis; a register of literature and science, conducted by members of the Catholic University of Ireland,' the title of which would seem to imply that literature and science are to be dragged into that arena of religious warfare which has so long poisoned the life-blood of Ireland.

We cannot conclude this list without adverting in terms of the highest praise to the *fifteenth* edition of Dr. Dunglison's great 'Dictionary of Medical Science,' in which six thousand subjects and terms have been added. We also point with satisfaction to the fact that medical logic appears to have secured a professorial chair; if we may draw this conclusion from the fact that we have received an elaborate syllabus of lectures on the subject, purporting to have been delivered at Aberdeen. Strange to say, the lecturer's name is not given.

PART THIRD.

Original Communications.

Art. I.

Pathological Report of the Middlesex Hospital; being an Analysis of the Principal Morbid Appearances observed in 180 *Post-Mortem Examinations, from the* 1*st October*, 1855, *to the* 1*st October*, 1856.

By Philip J. Van der Byl, M.D. Edin., Licentiate of the Royal College of Physicians, Lecturer on Histology at the Middlesex Hospital, &c.

During the first year that I conducted the post-mortem examinations at the Middlesex Hospital, 180 cases were examined. Of these, 98 were males and 82 females. The chief object of this report is to exhibit the relative frequency of the principal morbid appearances observed, and the connexion of individual diseases with certain morbid conditions. In the general index which I have made to our post-mortem register, every morbid appearance is entered, and under each heading are placed numbers referring to the cases in which that particular lesion occurred. From this index the headings and the numbers of the cases are taken, so as to exhibit the occurrence of individual morbid appearances, not of separate cases of fatal disease. Thus, for example, one fatal case may be noted in three, four, or five different places, according to the number of well-marked lesions it exhibited. The arrangement is entirely anatomical, that is, founded on the physical changes observed in the organs; and not nosological, or having reference to symptoms, causes, &c. Remarks, in the shape of short notes, have been made upon most of the headings, and these doubtless might be extended; but being limited in space, I was obliged to confine my remarks only to a very brief statement of facts, and must defer for the present all deductions. In a practical point of view, the usefulness of a pathological report would probably be much increased by giving a brief history of the cases before death; but this plan was abandoned by me, as it was thought that even a very brief notice of this kind would detract from the interest of a nosological report at present in course of preparation by our medical and surgical registrars.*

After stating the number of cases under each heading, I have given the post-mortem register number of each case. I resolved upon doing so, because these numbers really occupy very little space, and an opportunity is thus afforded of tracing the relations of diseases beyond what I have done, and of satisfying one's self as to the existence of certain morbid conditions along with any particular disease. Thus, for example, the numbers under adherent pericardium will show in which cases there was hypertrophy of the heart; the numbers under fatty heart will show in which cases there was granular disease of the kidneys, and so forth. References have been given to all cases or specimens of which any account has been published; also to those specimens which are preserved in the museum of the hospital. I have arranged my present materials under fourteen sections—viz.,

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* I wish to acknowledge my obligations to Mr. Balding for his kind assistance on many occasions.

1. Brain and its Membranes. 2. Spinal Cord, its Membranes, and the Nerves. 3. Heart and Pericardium. 4. Bloodvessels. 5. Air-passages, Lungs, and Pleuræ. 6. Alimentary Canal. 7. Liver, Gall-bladder, and Biliary Ducts. 8. Spleen. 9. Kidneys and Urinary Passages. 10. Genital Organs and Mammary Glands. 11. Lymphatic and Lacteal Glands. 13. Bones and Joints. 14. External Appearances, Skin, &c.

I. BRAIN AND ITS MEMBRANES.

1. Cancer of Dura Mater, communicated from Cranial Bones, 2 cases: Nos. 480, 498.—In Case 480 (a man aged forty-five) the cancerous growth commenced in the antrum, and extended to the base of the skull and the bones of the forehead and face, and thence to the dura mater. The bones forming the anterior half of the base of the skull, and the other bones just named, also the petrous portion of the temporal bone, were quite soft, and easily cut with the knife. In the antrum and sphenoidal sinuses, the cancer presented an exuberant nodular appearance. On squeezing sections of this growth, it yielded a thick creamy stuff, which contained many compound nucleated cells. The anterior half of the dura mater on the right side was about half an inch thick, and presented a uniform firm medullary appearance. Some juice scraped from this part exhibited large compound nucleated cells, with several nuclei. The internal surface of the base of the skull was comparatively smooth; the brain was not affected, but there was much sub-arachnoid serous effusion.—In Case 498 (a man aged twenty-eight), the primary disease was scirrhous cancer of the liver, which weighed twelve pounds. (See VII. 5.) There was cancer of the spleen, lung, and lumbar vertebræ; a cancerous tumour about the size of two fists involved the upper part of the sternum, the half of it projected into the chest. It was firm, nodulated, and elastic, exhibiting a radiating fibrous appearance on section; a similar tumour, about the size of half an orange, was situated over the occipital bone, and sent long spiculæ inwards, which involved the dura mater, below the left lateral sinus, in the growth, and produced yellow softening of the brain and breaking up of the cerebellum. The lower half of the humerus was surrounded by cancerous growth.—Museum, V. 2^j, IV. 36^d, 43^b.

2. Osseous Growth in Falx Cerebri, 1 case: No. 463.—A man aged thirty-five, who died of phthisis and tubercular meningitis. The growth measures an inch and a half long, half an inch broad, and about a quarter of an inch thick; it is situated in the lower border of the falx cerebri, near its anterior extremity, and presents a nodulated surface with thin edges (Museum, V. 1^c.) This man had a diverticulum of the intestine. (See VI. 13.)

3. Laceration of Dura Mater and of Brain, 2 cases: Nos. 518, 521.—Both these occurred in cases of fracture of the skull.

4. Congestion of Membranes of Brain, 9 cases: Nos. 387, 391, 455, 461, 493, 527, 530, 534, 541.—Of these, 2 were cases of typhus, 2 typhoid fever, 1 cerebral hæmorrhage, 1 tubercular meningitis, 1 erysipelas of the head, 1 "congestive apoplexy," with great serous effusion beneath the arachnoid, and 1 cerebral hæmorrhage and softening of brain.

5. Excess of Serum beneath Arachnoid, 14 cases: Nos. 384, 395, 405, 419, 436, 447, 449, 460, 461, 470, 480, 483, 523, 541.—These occurred as follows: in typhus 2, typhoid fever 1, erysipelas 1, carditis and softening of brain 1, hypertrophy of heart 2, drowning 1, tubercular peritonitis 1, chronic hydrocephalus 1, "congestive apoplexy" 1, cancer of antrum and dura-mater 1.

6. Excess of Serum in Ventricles of Brain, 10 cases: Nos. 384, 387, 405, 410, 419, 460, 483, 523, 527, 531.—In Case 483, a man aged sixty, who died of chronic hydrocephalus, the lining membrane of the ventricles presented a *dotted appearance;* in the anterior part of the ventricles, this punctated appearance was most distinct, and a few specks of lymph were seen; about three drachms of turbid serum were contained in each ventricle. There was softening of the septum lucidum and of the anterior boundary of the left ventricle.—In Case 410, a woman aged fifty-three, the convolutions of the cerebrum were very much flattened and very pale; the lateral ventricles were much enlarged, and contained six ounces of clear serous fluid. This woman had aneurism of the basilar artery, (See I. 16)—Museum, V.

7. Opacity of Arachnoid, 8 cases: Nos. 436, 445, 449, 456, 461, 480, 483, 498.

8. Effusion of Lymph beneath Arachnoid, with Tubercles in Pia Mater, 3 cases: Nos. 463, 492, 530.—These occurred with tubercle of the lungs and softening of the brain in Case 463; with tubercle of the lungs, tubercular peritonitis, and tubercular ulceration of the intestines in Case 492; and with Tubercle in the bronchial glands (not in the lungs) in Case 530.

9. Cysts in Choroid Plexus, 1 case: No. 489.

10. Cerebral Hæmorrhage ("Apoplexy") 3 cases: Nos. 387, 410, 493.—In Case 387, with aneurism of posterior cerebral artery; in Case 410, with aneurism of the basilar artery; and in Case 493, the hæmorrhage was in the substance of the pons Varolii, and filled the fourth ventricle.

11. Hæmorrhagic Spots in the Pineal Body, 1 case: No. 461.—This occurred in a woman aged twenty-four, who died of typhoid fever. The Pineal gland was twice the usual size, and was marked by five or six hæmorrhagic spots the size of a pin's head. (See VII. 19.)

12. Softening of Brain, 9 Cases. Red, 5: Nos. 463, 483, 493, 530, 531. Yellow, 4: Nos. 387, 419, 498, 505.

13. Disease of Cerebral Arteries, 1 case: No. 436.—A man aged twenty-five. The large arteries at the base of the brain exhibited thick fibroid patches, which on section were found to project into the vessels, and at some places nearly to obliterate the anterior and middle cerebral arteries.

14. Calcification of Minute Cerebral Arteries, 1 case: No. 505.—A man aged fifty-four. When the upper portion of the cerebral hemispheres was sliced off, only a few bloody points were seen in each centrum ovale, but numerous sharp points projected from the surface, like very short bristles. These on being seized with a forceps and drawn out, were found to be calcified vessels, which were quite rigid, and were easily broken up into several pieces by slight pressure. They were rather tortuous, and generally not half so thick as a pin. At the anterior part of the left hemisphere was a small patch of yellow softening.

15. Obstruction of Middle Cerebral Artery by a Fibrinous Plug, 2 cases: Nos. 413, 419.—Case 413, a woman aged thirty-seven, suffering from cancer of the uterus, was seized with a pain in the left temporal region, which lasted half an hour; she then suddenly lost the use of her right side, but retained her consciousness; she was able to move the mouth, but could not speak for eight days. She became quite listless, and died twenty-two days after the sudden headache and paraplegia. The middle cerebral artery was obstructed at its very origin by a triangular-shaped fibrinous plug, its greatest length being about a quarter of an inch. About an inch from its origin, where a large branch was given off, another little plug was found; the trunk of the artery beyond this was filled with a slightly-coloured fibrinous clot, nearly half an inch long, which was connected with the little plug, but presented a less dense appearance. The space between the two plugs was empty, and there was no adherent lymph about the arteries involved. The substance of the brain felt rather flabby, but was not softened. The *heart* was flabby and enlarged; warty vegetations, the size of peas, were found on the aortic and mitral valves; they were rough, pointed, and not very adherent. The spleen presented three or four purulent spots, and adherent lymph occurred in the iliac veins from the pressure of a cancerous growth of the uterus and lumbar glands.*

In Case 419 (a female, aged sixteen), partial obstruction of the left middle central artery occurred along with fibrinous deposits in the spleen and kidneys. A thin fibrinous clot, not nearly filling the vessel, was found to run from its origin for about one inch and a-half; here the artery bifurcated, and a dark black clot filled and plugged up the two branches; on tracing these two branches, they were found to proceed to a depressed, softened patch, about the size of a crown-piece, situated near the middle of the external surface of the left hemisphere. The heart weighed nineteen ounces; the valves were healthy, but the lining membrane of the left auricle was thickened, and covered by fibrinous layers, which could be peeled off. The axillary and left common femoral arteries were found plugged by fibrinous coagula about one inch long, which were adherent to the lining membrane, and of a reddish-yellow colour. It appears doubtful whether the obstruction in any of the arteries was produced by fibrinous particles carried direct from the heart, and it seems altogether more probable that the blood was, as it were, overcharged with fibrin, that a spontaneous coagulation took place in the larger as well as in the smaller arteries, and that this was followed by decoloration of the clots. The axillary and femoral arteries may also have been more or less inflamed at the points where the coagula were situated.

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* For sketch of the artery and further particulars by the author, see Transactions of Pathological Society, vol. vii. p. 118.

This patient was first seized with a pain in the head and face, and a few days after she awoke in the morning and found she had lost all power in the right hand and arm, and could only *drag* her right leg along the ground. She had also lost her voice, but was not aware that she had any kind of a fit; her mental powers seemed entire.—For particulars see 'Trans. of Pathological Society,' vol. vii. p. 168.

16. Aneurism of Cerebral Arteries, 2 cases: Nos. 387, 410.—Case 387, aneurism of the posterior cerebral artery occurred in a man aged fifty-six. The tumour was about the size of an egg, and was situated in the posterior part of the right ventricle; the surrounding brain-substance was softened. On section the tumour presented a laminated appearance, the sac was thick and firm, the opening into the vessel distinct (Museum V. 35).—Case 410, aneurism of the basilar artery occurred in a woman aged fifty-three, who died of rupture of the aneurism. There was a considerable amount of coagulated blood around the pons Varolii, and at the base of the brain. The aneurism was about the size of a hazel-nut. The lateral ventricles were very large, and contained six ounces of serum (Museum V. 36).*

II. Spinal Cord, its Membranes, and the Nerves.

1. Softening of Spinal Cord, 2 cases: Nos. 452, 483.

2. Spinal Arachnitis, 1 case: No. 511.

3. Cancer of Phrenic Nerve, 1 case: No. 425.—This occurred in a case of cancer of the breast; the disease extended inwards, and involved the pleura and pericardium, and a few cancerous nodules were seated upon the phrenic nerve in its course across the pericardium. (See XI. 6.)

III. Heart and Pericardium.

1. Serous Effusion into Pericardium (Hydropericardium), 4 cases: Nos. 387, 417, 420, 537.—In Case 420 there were ten ounces of turbid fluid in the pericardium, and the heart weighed twenty-six ounces.

2. Serous Effusion with recent Lymph in Pericardium (Pericarditis), 12 cases: Nos. 395, 398, 412, 419, 426, 450, 458, 459, 470, 498, 513, 516.—In Case 513 only is it noted that the patient had acute rheumatism.

3. Adherent Pericardium, 7 cases: Nos. 393, 407, 426, 484, 506, 513, 550.

4. Cancer of Pericardium, 2 cases: Nos. 425, 431.—In both cases the cancer was propagated from the breast, and also involved the pleura.

5. White Patches on Heart, 18 (well-marked) cases: Nos. 387, 389, 395, 411, 412, 423, 425, 426, 433, 435, 449, 473, 482, 491, 512, 516, 537, 547.

6. Thickening and Opacity of Endocardium, 2 cases: Nos. 389, 546.

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* These two cases are more fully described by the author, in the Transactions of the Pathological Society, vol. vii. pp. 122 and 129.

7. Hypertrophy of Heart, 30 cases: Nos. 385, 387, 389, 397, 398, 412, 415, 419, 420, 428, 436, 444, 448, 454, 457, 458, 469, 470, 471, 478, 482, 484, 487, 499, 503, 514, 516, 537, 550, 561.—In 2 cases the heart weighed thirty ounces. In one of these, No. 448, the valves were scarcely diseased, but the arch of the aorta was dilated to nearly double its natural size, and was affected with advanced atheromatous disease, which extended upwards into the carotid and axillary arteries, and downwards into the femoral arteries. In some parts of the aorta calcified plates nearly one inch in diameter were found. In the second case (389), there existed vegetations on the aortic and mitral valves, and thickening of the endocardium.—In Case 457, the heart weighed thirty-six ounces.*

8. Vegetations on Aortic or Mitral Valves, 9 cases: Nos. 385, 389, 393, 412, 413, 420, 428, 450, 550.—In Case 413, some of the vegetations were carried upwards by the current of the blood, and produced obstruction of the middle cerebral artery. (See I. 15.)

9. Fatty Degeneration of Heart, 17 cases: Nos. 386, 393, 431, 453, 462, 467, 468, 479, 487, 501, 509, 510, 544, 554, 555, 556, 557.

10. Fibroid Patches, or Solid Exudation in Substance of Heart (Carditis), 9 cases: Nos. 413, 419, 420, 428, 443, 445, 460, 462, 555.—In Case 428, the columnæ papillares of the mitral valve were eroded or ulcerated, and fibrinous deposits occurred in the kidney.

11. Aneurism of Heart, 1 case, No. 490.—This occurred in a man aged fifty-seven, who had a cancerous stricture of the œsophagus, with perforation into the left bronchus by ulceration. The aneurism consisted of a dilated pouch near the apex of the left ventricle; it was lined by yellow fibrin, to which adhered a clot about the size of a walnut. The coronary arteries were ossified; the valves of the heart were healthy.

12. Pulmonary Semilunar Valves, four in number, 1 case, No. 517. —A woman aged thirty-three, who died of cancer of uterus.—Museum VI. 17^8.

IV. Bloodvessels.

1. Atheromatous Disease of Aorta, 11 (extreme) cases: Nos. 394, 399, 406, 415, 424, 448, 450, 482, 483, 537, 562.—Slight atheroma, in the shape of small white patches at the commencement of the aorta, occurred in so many cases, that it could scarcely be counted among the principal morbid appearances.

2. Dilatation of Aorta, 4 cases: Nos. 415, 424, 448, 482.—These occurred along with atheroma, and are included in the above heading.

3. Aneurism of Aorta and Innominate Artery, 1 case: No. 466.

4. Obstruction of Axillary and Femoral Arteries, 1 case, No. 419.—This occurred in the case of partial obstruction of the middle cerebral artery, along with carditis, softening of the brain, and fibrinous deposits in the spleen and kidneys. (See I. 15.)

5. Fibrinous Plugging of Iliac Artery, 1 case: No. 465.—A woman,

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* These three cases will be more fully described by the author, in the Transactions of the Pathological Society, vol. ix.

aged thirty-nine; her complaint commenced with shooting pains and a sensation of numbness and coldness in both legs and feet; a fortnight after this, on stooping to pick something from the ground, these symptoms increased in the left, but passed away completely from the right leg. Pulsation now ceased in the left femoral artery, and gangrene of the leg supervened. On *examination*, a firm, yellowish-white, fibrinous coagulum, about the size of an almond, was found at the very origin of left common iliac artery, which it completely obstructed, its upper end projecting into the aorta; it was not adherent to the lining membrane of the artery. Below this coagulum the common iliac and all its branches were filled with dark-coloured and tolerably firm coagulated blood. Both sides of the heart contained loose black clots, together with three or four firm whitish coagula about the size of hazel-nuts, exactly resembling that in the iliac artery, but firmer, more opaque, and of altogether different appearance from the ordinary colourless coagula usually found in the heart after death. There were no vegetations on the valves.*

6. Destruction of Internal Jugular Vein, 1 case: No. 388.—This was occasioned by scrofulous abscesses in the neck. The jugular vein was destroyed by suppuration, the inflammation extended to the lateral sinuses, and metastatic abscesses occurred in the lungs. The patient was a woman aged twenty-four.

7. Suppuration of Lateral Sinuses occurred in the above case, along with Destruction of Internal Jugular Vein.

8. Adherent Lymph and Pus in Iliac Veins, 2 cases: Nos. 413, 481.—In Case 413, a woman, aged thirty-seven, the phlebitis was produced by a cancerous growth pressing on the iliac veins; for history of this case, see I. 15. In Case 481, a boy, aged twelve, phlebitis was the result of amputation of the thigh, and metastatic abscesses occurred in the lungs.

9. Purulent Lymph, &c., in Uterine Veins, 1 case: No. 435.—A woman, aged forty-four, died, a few days after confinement, of puerperal endometritis. The uterus was six inches long and four broad, the internal surface was rough and in a gangrenous state; on section, the vessels were found filled with purulent lymph. The veins in the lumbar region contained pus. (Museum, XIII. 48.)

10. Atheroma of Pulmonary Artery, 1 case: No. 448.

11. Diseases of Cerebral Arteries. (See I. 13 to 16.)

V. AIR-PASSAGES, LUNGS, AND PLEURA.

1. False Membrane in Larynx, Trachea, and Bronchi (Croup), 1 case: No. 393.—A man, aged thirty-eight; the false membrane lined the entire trachea, projected through the chink of the glottis, and ex-

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* For particulars, see Mr. Flower's account in the Transactions of the Pathological Society, vol. vii. p. 175. He thinks that the symptoms would indicate that one of the white coagula, having escaped from the heart, and found its way into the general circulation, had at first been arrested at the bifurcation of the aorta, and that afterwards, in the act of stooping, it became tilted into the left iliac artery, and completely obstructed that vessel.

tended into the minute bronchi, quite filling them. (Museum, VII. 23*a* and 23*b*.)

2. Muco-purulent Matter in Bronchi, with Congestion (Bronchitis), 6 cases: Nos. 392, 405, 426, 444, 448, 543.—These were all well-marked cases, and more or less acute.

3. Muco-purulent Matter in Bronchi, with Emphysema (Chronic Bronchitis), 5 extreme cases: Nos. 417, 422, 428, 453, 467.

4. Dilatation of Bronchi, 1 case: No. 442.—A girl aged six, who died of hooping-cough; she had tubercle in the lungs, and in the bronchial glands; also lobular pneumonia.

5. Ossification of Bronchi, 1 case: No. 425.—A woman aged sixty-four, died of cancer of breast; on laying open the bronchi, they exhibited numerous white specks, which were found to be calcified spots in the bronchial cartilages; and this appearance extended to the smallest bronchi.

6. Cancer of Bronchi, 1 case: No. 425.—In some of the larger bronchi of the above case, distinct nodules up to the size of a pea, presenting a warty appearance, were growing from the mucous membrane. The disease did not grow from the outside of these tubes.

7. Perforation of Bronchus, 1 case: No. 490.—This occurred in a case of cancer of the œsophagus, in which the ulceration extended into the left bronchus, immediately beyond the bifurcation of the trachea; the size of the opening being half an inch in diameter. The surrounding bronchial glands were enlarged, and the tissues condensed.

8. Cancer of Lung, 10 cases: Nos. 396, 399, 400, 402, 406, 431, 473, 476, 498, 557.—Of these 4 were males, and 6 females. In 2 of these cases there existed old cretaceous tubercles in the lung, and in 1 case (476), old cicatrices at the apex of the lung. Along with the cancer of the lung in these 10 cases, there existed cancer of uterus in 2 cases; of kidney, 3 cases; of breast, 3 cases; of liver, 7 cases; of rectum, 1 case; of pleura and pericardium, 3 cases; of œsophagus, 1 case; of tongue, 1 case; of spleen, 1 case; of sternum, vertebræ, humerus, skull and dura mater, 1 case; post-peritoneal tumour and cancer of lumbar vertebræ, 1 case.

9. Tubercle of Lungs, 33 cases; without cavities, 17 cases: Nos. 404, 437, 442, 445, 446, 456, 459, 475, 492, 500, 501, 525, 535, 538, 540, 546, 552.

10. Tubercle of Lungs, with cavities, 16 cases: Nos. 423, 430, 438, 443, 463, 474, 507, 508, 509, 510, 520, 526, 528, 532, 539, 554.—Tubercle of the lungs was thus actually concerned in upwards of one-sixth of the 180 cases examined. Of these 33 cases, 23 were males, and 10 females.

11. Cicatrices at Apex, or in Substance of Lung, 15 cases: Nos. 386, 395, 396, 399, 400, 402, 426, 446, 459, 476, 478, 482, 550, 553, 555.—In 2 of these cases (446 and 459), there was recent or active tubercle in other parts of the lung; in the remaining cases the cicatrices were such as might fairly be considered the result of tubercular disease,—mere superficial fibroid thickening of the pleura is not included.

12. Chalky Concretions in Lung, probably resulting from tubercle, 15 cases: Nos. 382, 400, 402, 435, 437, 460, 478, 485, 504, 505, 534, 548, 553, 555, 561.—In one of these cases there was recent tubercle in other parts of the lung. In 5 cases, cicatrices and concretions coexisted, leaving 10 cases of cicatrices only, and 10 cases of chalky concretions; and thus making 25 cases in which these conditions occurred singly or conjointly. Excluding the 3 cases above noted, in which recent or active tubercle co-existed with cicatrices or concretions, there remain 22 cases in which there was a decided tendency to the cure of tubercle of the lungs, and that is equal to two-thirds of the number in which the disease was found in activity.

13. Induration of Pulmonary Substance (Chronic Pneumonia), 4 cases: Nos. 454, 471, 482, 535.

14. Emphysema of Lungs, 8 extreme cases: Nos. 386, 417, 422, 428, 453, 459, 467, 546.—Of these, 5 occurred along with chronic bronchitis. Emphysema in a slight degree is so common that it cannot be included among the principal morbid appearances; the strongly-marked cases only are alluded to under this heading.

15. Congestion of Lungs, 8 extreme cases: Nos. 384, 386, 429, 447, 449, 466, 496, 506.

16. Œdema of Lungs, 2 extreme cases: Nos. 429, 449.—Slight œdema is so common that it cannot be included among the principal morbid appearances.

17. Hepatization of Lungs, 24 cases; of these 16 were red: Nos. 385, 391, 403, 405, 415, 418, 430, 443, 458, 469, 485, 524, 532, 535, 540, 553; 8 were grey: Nos. 390, 397, 423, 433, 472, 488, 514, 542.

18. Lobular Condensation (Lobular Pneumonia), 1 case: No. 442.—This occurred in the case of hooping-cough, with dilatation of the bronchi.

19. Pulmonary Apoplexy, 3 cases: Nos. 385, 428, 561.

20. Carnification of Lung (Splenization, Atalectasis), 11 cases: Nos. 399, 419, 433, 440, 453, 458, 476, 477, 494, 504, 557.

21. Metastatic Abscesses in Lungs (Multiple Abscesses, &c.), 4 cases: Nos. 388, 435, 481, 495.—These were caused by abscesses in the neck and destruction of the internal jugular vein in Case 388; by puerperal endometritis in Case 435; by amputation of the thigh, followed by phlebitis, in Case 481; and by excision of the knee-joint in Case 495.

22. Perforation of Lung, 1 case: No. 477.—A man, aged forty-six; the lung was carnified, and covered with a thick layer of purulent lymph; a circular opening, about a third of an inch in diameter, was situated on the surface. (Museum.)

23. Pneumothorax, 1 case: No. 446.—A woman, aged twenty-eight; the air was only contained in the right pleura, the costal portion of which was quite dry and very transparent; the surface of the lung felt viscid; the diaphragm, which was depressed, suddenly ascended when the thorax was opened; about an ounce of serous fluid was contained in the left pleural cavity, and it was not decomposed. No opening could be detected in the right lung.

24. Gangrene of Lung, 1 case: No. 424.—A man, aged sixty-five, who had cancer of the tongue.

25. Serous Effusion into Pleura, with recent Lymph (Pleuritis), 17 cases: Nos. 384, 385, 388, 390, 404, 433, 458, 469, 472, 476, 481, 485, 487, 488, 514, 520, 557.

26. Serous Effusion into Pleura, without Lymph (Hydrothorax), 7 cases: Nos. 415, 420, 475, 499, 503, 516, 537.

27. Purulent Effusion into Pleura, 11 cases: Nos. 390, 418, 433, 462, 477, 494, 497, 504, 519, 529, 539.—In Case 494, the effusion evidently produced perforation of the diaphragm. (See X. 7.)

28. Cancer of Pleura, 5 cases: Nos. 425, 431, 462, 476, 557.

VI. ALIMENTARY CANAL.

1. Tonsils and Pharynx lined with False Membrane (Croupous Tonsillitis), 1 case: No. 398.—A girl aged sixteen, who died of scarlatina.

2. Cancer of Tongue, 3 cases: Nos. 424, 476, 553.—All males, fifty to sixty years of age.

3. Cancer of Œsophagus, 3 cases: Nos. 443, 473, 490.—Two males and 1 female, fifty to fifty-seven years of age. In 2 of these there existed cancer of the stomach; in Case 490, there was great constriction of the œsophagus, with an ulcerated opening into the left bronchus.

4. Cancer of Stomach, 6 cases: Nos. 407, 408, 443, 490, 549, 556.—Four males and 2 females, from forty-two to seventy-two years of age. Of these, 3 had cancer of the liver; in 2 the liver was healthy, and in 1 the condition not noted.

5. Ulceration of Stomach (Chronic Inflammation), 2 cases: Nos. 436, 444.

6. Perforating Ulcer of Stomach, 2 cases: Nos. 418, 421.—Case 418, a woman, aged twenty, who had perforation of the diaphragm, &c. (See XI. 7.)—Case 421, a woman, aged fifty; the stomach was adherent to the diaphragm just below the false ribs, near the xiphoid cartilage, but was easily separated by traction. The ulcer was about the size of a sixpence, situated near the lesser curvature, towards the cardiac end. A little to the right of it a star-like cicatrix was seen on the peritoneal coat of the stomach; but the corresponding point on the inside of the stomach was not much puckered. The mucous membrane in the cardiac half of the stomach was slightly softened, and presented pits filled with dark pigment scattered over the surface, about one-fourth of an inch apart.

7. Perforating Ulcer of the Duodenum, 1 case.—This occurred in the case of perforating ulcer of the stomach with perforation of the diaphragm. (See XI. 7.)

8. Perforation of Ileum, 1 case: No. 512.—A woman, aged twenty-five, who died of typhoid fever. There were several ulcers in the lower part of the ileum, from one quarter to one inch in diameter; the edges were inverted, their surface smooth; they had for the most part reached the peritoneal coat. The perforation existed about three feet

from the ileo-cæcal valve, in the centre of one of the small ulcers, and was about a quarter of an inch in diameter. The feculent matter had escaped, and produced peritonitis; it was mostly lodged in the left side and pelvic cavity; a few coils of intestine near the perforation were covered with recent lymph, and were slightly adherent.

9. Tubercular Ulceration of Intestines, 9 cases: Nos. 423, 442, 445, 492, 507, 509, 520, 525, 535.—Tubercle of the lungs existed in all these 9 cases.

10. Typhoid Deposit in Peyer's Patches, 6 cases: Nos. 391, 461, 512, 524, 545, 551.—Of these, 5 were females, aged fourteen, sixteen, twenty-four, twenty-five, and forty-three, and 1 was a man, aged twenty. The Peyer's patches were ulcerated in 5 cases, and in these there existed also ulceration of the colon. It may here be noted, that typhus was stated as the cause of death in 6 cases out of the 180 examined. (Museum, VIII. 22^b.)

11. Ulceration of the Small Intestine (Catarrhal Inflammation), 2 cases. Nos. 439, 440:—Case 439, a man, aged sixty-nine, died of intestinal obstruction. He had an ulcer in the rectum, and the intestine had become folded and adherent, by recent lymph, in such a way as to produce obstruction. The small intestine was greatly distended; its internal surface was rough, very dark red, and presented large patches of ecchymosis; the mucous membrane was ulcerated in transverse patches or streaks between the valvulæ conniventes, which were partly covered with recent lymph; at the termination of the ileum a patch of Peyer's glands was distended, villous, and dark brown, but not ulcerated. In the ascending colon, there was one ulcer nearly the size of a two-shilling piece, and several smaller ones; also several dark-blue patches, and some cicatrices (Museum, VIII. 16*a*).—Case 440, see below, VI. 12.

12. Intestinal Obstruction, 4 cases: Nos. 439, 440, 496, 560.—Case 439 was produced by an ulcer of the rectum, and accompanied by catarrhal inflammation (see VI. 11).—Case 440, a woman aged forty-six, of bilious and costive habit, was seized with vomiting, and sharp pain in the right iliac region; she had no motion during the next ten days, but an injection being then administered she voided several large scybalous masses. Her countenance was pinched and anxious; cheeks florid; tongue dry; thirst urgent; pulse 80, small; vomiting, sometimes stercoraceous, occurred from time to time; the abdomen became very painful and distended; retching was frequent; and she died from exhaustion. On examination, a solid body, about the size and shape of a cork, was found to block up the small intestine about the middle of the ileum, where it fitted like a plug. At the point of obstruction the intestine was bent upon itself, the adjacent peritoneal surfaces being slightly adherent by recent lymph. The intestine seemed to become suddenly smaller immediately below the obstruction, but above this point it was greatly distended, and filled with dark greenish feculent matter, in which were found ten angular biliary calculi, about half the size of hazel-nuts. The dilated portion of the intestine was dark, and when laid open the mucous membrane was

found much congested, in some parts covered with adherent lymph, and a number of small ulcers were scattered over the surface. The obstructing body was discovered to be a large biliary calculus. It was perfectly cylindrical, measuring nearly four inches in circumference, and one inch and a quarter in diameter; its external surface was uniformly nodulated, the extremities being rather smooth; and when divided transversely, it exhibited a crystalline appearance. The gall-bladder was firmly adherent to the duodenum at the point where it turns downwards to become perpendicular, and a well-defined communication existed between these two parts, large enough to admit a finger easily. The gall-bladder was contracted and converted into a small fibrous pouch: but there can be no doubt that the calculi passed through this perforation, although the opening was now much smaller than the calculus causing the obstruction.* (Museum, VIII. 57, and IX. 15.)—Case 496, a woman, aged sixty-one, who died of ileus. On examination, large scybalous masses only were found in the great intestine, which was much contracted in some parts.—Case 560, a boy, aged thirteen. There was considerable peritonitis, and the small intestines were very adherent in the pelvic cavity; some of the intestines being sharply twisted, prevented the passage of feculent matters.

13. Diverticulum of Small Intestine, 1 case: No. 463.—A man, aged thirty-five, in whom was found the osseous growth in the falx cerebri already described, (I. 2.) The diverticulum was about three inches long, somewhat smaller in calibre than the ileum, situated two feet from the termination of the ileum, projected from the intestine near its mesenteric attachment, and was fixed to the mesentery for nearly its whole length by a reduplication of peritoneum. It was about the shape and size of a man's thumb, the extremity being somewhat conical.

14. Ulceration of Colon (Dysentery), 10 cases: Nos. 416, 436, 439, 461, 463, 512, 523, 524, 545, 551.—Case 416, a man, aged forty-seven. The ulceration involved the folds of mucous membrane which projected into the gut, and presented transverse streaks, about half an inch wide, for the most part covered with yellowish sloughs, which, when removed, left a rough ulcerated villous surface of an ash-grey colour.—Case 436, a man, aged twenty-five. The ulcers were arranged peculiarly in three main rows, exactly opposite the three longitudinal muscular bands which are situated in the outer muscular coat of this intestine; a few ulcers were, however, situated between the rows on the projecting folds.—Case 439 occurred along with ulceration of the rectum, which produced intestinal obstruction, and ulceration of the small intestine (see VI. 11).—In Case 463 (a man, aged thirty-five, who had tubercle of the lungs, and tubercular meningitis), one ulcer only, about half an inch in diameter, with thickened edges, occurred in the cæcum. The solitary glands of the ileum were enlarged and filled with curdy matter. In 5 of the cases, ulceration of the colon was associated with typhoid deposit and ulceration in the small intestines. (See VI. 10.)

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* For particulars, see Dr. Van der Byl's account in the Transactions of the Pathological Society, vol. viii. p. 231.

15. Ulceration of the Rectum, 4 cases: Nos. 437, 439, 515, 559.—Case 437 occurred along with tubercle of lungs and circumscribed peritonitis; in Case 439 it produced intestinal obstruction and ulceration of the small intestine (see VI. 11); Case 515 resulted in perforation and peritonitis.—Case 559, a woman, aged thirty-three: a large irregular ulcer involved the entire circumference of the gut, and produced stricture of the rectum. The edges of the ulcer were thick, its surface shaggy; the mucous membrane and muscular coats were entirely destroyed. Below the ulceration the intestine was constricted to the size of a little finger for six inches in extent.

16. Perforation of Rectum, 1 case: No. 515.—This occurred in a case of ulceration of rectum.

17. Stricture of Rectum, 3 cases: Nos. 400, 439, 559.—Case 400 was produced by cancer, and scarcely admitted the little finger; the other two cases were associated with ulceration, and are described above.

18. Cancer of Rectum, 1 case: No. 400.

19. Strangulated Inguinal Hernia, 1 case: No. 451.—A man aged forty-six. The hernia was on the right side, and had descended into the scrotum, forming a tumour about the size of a child's head. The parts contained within the sac were the caput cæcum coli, along with two inches of the terminal portion of the ileum, and a coil of small intestine, about eight inches in length, and eighteen inches above the constricted part of the small intestine just mentioned; also the great omentum. These parts were mostly dark red or purple, especially the coil of small intestine, the mucous surface of which was black and excessively congested (semi-gangrenous). The mucous membrane of the small intestine was ulcerated opposite to the constricted part, but externally this part was pale. The neck of the sac measured five inches in circumference; the peritoneal cavity contained about half a pint of dark yellow serum; its surface was much congested in different parts, and in some places covered with recent lymph.

VII. Liver, Gall-bladder, and Biliary Ducts.

1. The condition of the liver was not noted in 20 cases.

2. The liver was healthy in 60 cases.

Of these 31 were males and 29 females. The average age of the 31 males was thirty-four, including 2 boys of seven years of age; the oldest was fifty-seven. The average weight of the liver of 26 of these males was 51·3 ounces. The greatest weight was 83 ounces, and occurred in a man aged thirty-eight, who had diabetes and croup (Case 393, V. 1): the least weight was 32 ounces, and occurred in a man aged forty-seven, who died of dysentery, &c.—Case 416. The liver of one boy, aged seven, who died of an enormous cancerous growth of the kidney, weighed 39 ounces—Case 489. The average age of the 29 females was 39·2; the oldest was eighty-one, the youngest six. The average weight of liver of 25 of these females was 43·8 ounces. The greatest weight was 64 ounces, and occurred in a girl, aged fourteen, who died of typhoid fever—Case 545. The least weight was 20 ounces, and occurred in a woman, aged thirty-two, who died of cancer of the uterus—Case 414.

3. The condition of the liver was doubtful in 13 cases: *i.e.*, the description of its state does not warrant its being placed under any of the present headings.

4. The liver was changed in shape in 3 cases: Nos. 458, 459, 485. —Two of these were cases of cirrhosis; in Case 458, a woman, aged forty-eight, the liver was elongated to nearly double its usual length, and was constricted about its middle, the capsule being thickened on the convex surface, opposite the constriction; the breadth of the liver was much less than usual, it weighed thirty-six ounces. In Case 459, a female, aged forty, the shape and capsule were the same as the above; the weight forty-eight ounces. In Case 485, the liver was elongated transversely, and it was healthy in structure.

5. Cancer of Liver, 14 cases: Nos. 400, 402, 406, 407, 408, 409, 433, 468, 473, 476, 498, 517, 556, 557.—Of these 7 were males and 7 females. The average age of the 7 males was 43·7, of the females 49. The average weight of liver of the 7 males was 85·1 ounces, and of 6 of the females 42 ounces. The largest cancerous liver weighed *twelve pounds*, and occurred in the youngest of the 14 subjects, a man, aged twenty-eight. In this case (498) the cancerous growths also involved the skull and dura mater, the sternum and humerus, the lungs and spleen. (See I. 2.) This liver contained several cancerous growths, varying in size from half an inch to four or five inches in diameter; the largest growth was situated in the right lobe, and extended into the right iliac region. On section, the hepatic tissue appeared normal, all the cancerous growths exhibited a well-defined outline; they were mostly round, firm, yellowish-white, and presented a fibrous stroma, with a clear juice between the meshes, but on squeezing yielded a turbid juice (not thick and pulpy), which under the microscope exhibited numerous nuclei of large size, but no mother cells. (Museum, IX. 17.)

In these 14 cases of cancer of the liver, *other organs were involved* in the cancerous disease, as follows:—The tongue in 1 case, œsophagus 1; stomach 3; rectum 1; spleen 1; kidneys 1; diaphragm 1; pleura 2; lungs 7; breast 2; uterus 4; skull, dura mater, vertebræ, &c. 1; cervical glands 1; bronchial glands 1; lumbar glands 1; inguinal glands 1; post-peritoneal glands, forming a tumour, 1.

In these 14 cases of cancer of the liver, *other diseases occurred* as follows:—Old cretaceous concretions and cicatrices in the lungs in 3 cases; pleuritis and carnification of lungs in 3 cases; peritonitis in 1 case; fatty heart in 1 case; granular disease of kidneys in 3 cases; jaundice and yellow staining of all the internal organs in 1 case.

The *liver-tissue* intervening between the cancerous growths generally presented a normal appearance, hence doubtless the rarity of jaundice, which only occurred in 1 of the 14 cases. In one case (402) the liver-tissue is noted as being somewhat waxy, and in 1 case as fatty. The liver was adherent to the diaphragm and abdominal parietes in 2 of the 14 cases.

6. Tubercle beneath the Peritoneal Covering of Liver, 1 case: No. 529.—A girl, aged ten, died of tubercular peritonitis; the tubercles seen on the surface of the liver were soft, and did not extend into the liver-tissue; the liver was firmly adherent to the abdominal parietes.

7. Vascular or Erectile Growths in the Liver, 2 cases: Nos. 505, 535.—Case 505, a man, aged fifty-four, died of softening of the brain; the liver was healthy, but a vascular growth, about the size of a hazel-nut, occurred on the inferior surface of the right lobe.—In Case 535, a man, aged forty-eight, the liver on section exhibited three or four patches of erectile tissue within its substance; these were about the size of peas.

8. Anæmia of Liver, 1 case, No. 464.—A man, aged sixty, died of cancer of the bladder and hæmorrhage; the liver was remarkably pale and bloodless, the lobules were indistinct, the kidneys also were pale, and exhibited a yellow (fibrinous) deposit about the bases of the cones.

9. Recent Lymph on Surface of Liver (Inflammation of Peritoneal Covering), 3 cases: Nos. 404, 437, 497.—Of these, 1 occurred with tubercular peritonitis, and 2 with simple peritonitis.

10. Pus on Surface of Liver (Peritonitis), 1 case: No. 418.—This occurred along with perforation of diaphragm, &c. (See XI. 7.)

11. Liver adherent to Abdominal Parietes, 10 cases: Nos. 395, 404, 406, 418, 477, 492, 498, 499, 529, 555.

12. Liver adherent to Viscera, 2 cases: Nos. 406, 418.—Both involved the stomach; in Case 406, there was cancer of the liver, with chronic adhesions to the stomach, diaphragm, and abdominal parietes. Case 418, see XI. 7.

13. Capsule of Liver Thickened, 5 cases: Nos. 458, 465, 475, 503, 504.—Of these, 3 were females and 2 males; in 2 cases there existed cirrhosis, in 1 the liver was fatty, in 1 congested, and in 1 healthy.

14. Cicatrix on Surface of Liver, 1 case: No. 555.—A woman, aged forty-three; the liver was adherent to the diaphragm by several bands of old connective tissue, the cicatrix was situated at the posterior part of the right lobe, and extended about an inch into the substance of the liver. A cyst, about the size of a hazel-nut, was found in the left lobe, its wall was about a line thick, and very firm fibroid; it contained a glairy fluid. The liver substance was dark and shining on section, but there was no cirrhosis.

15. Abscess of Liver, 1 case: No. 399.—A woman, aged fifty-five, who also had ulcerated and sloughing cancer of the breast extending into the axilla, and cancer of the lungs. The liver weighed forty-two ounces; small abscesses, varying in size from a pea to a hazel-nut, were scattered throughout the liver, and visible on the surface. They were surrounded by a dark-blue outline, and contained thick green pus. The abscesses were no doubt metastatic, and occasioned by the ulcerated wound of the axilla.

16. Fibrinous Deposits in Liver, 3 cases: Nos. 427, 495, 500.—It is doubtful whether these would have become (metastatic) abscesses.

In Case 427, a lad, aged seventeen, it occurred with periostitis of the tibia, in which pus had accumulated beneath the periosteum and produced necrosis.—Case 495, a man, aged twenty-four, who had undergone excision of the knee-joint. On examination, the knee was found in a suppurating condition, and yielded a most offensive odour. The liver weighed seventy-three ounces, was firm, and mottled by yellowish patches, which on section were found to extend throughout the organ. At some parts this appearance seemed to be produced by a deposit *within the lobules;* at other parts, again, the discoloration was diffused, and some portions of liver presented the normal condition, but were paler than usual.—Case 500, a man, aged twenty-two, with angular curvature of the spine produced by scrofulous caries; the body of the fifth dorsal vertebra was entirely destroyed, and surrounded by a collection of curdy pus. The right kidney had a calculus impacted in the commencement of the ureter; the liver was pale brown, rather brittle, and marked by patches of soft yellowish deposit, producing a mottled appearance. The bladder was much thickened, and contained pus; its mucous membrane was dark blue, and marked by patches of congestion.

17 and 18. Granular Disease of Liver (Cirrhosis), 20 cases: Nos. 394, 405, 412, 424, 428, 438, 441, 457, 458, 459, 469, 471, 475, 482, 484, 494, 501, 513, 514, 561.—In 4 of these cases the disease was in a very early stage, and the condition of the liver is described as hypertrophy of the interlobular substance, Nos. 405, 412, 424, 484.

Of the 20 cases of cirrhosis, 15 were males and 5 females. The average age of the 15 males was thirty-eight; the oldest was sixty-six, the youngest eleven. The average age of the 5 females was 42·6; the oldest was sixty-three, the youngest twenty. The average weight of liver of 14 of the males was 58·1 ounces; the greatest weight was 106 ounces, the least was 33 ounces. The average weight of liver of the 5 females was 47·8 ounces; the greatest was 58 ounces, the least 36 ounces. The heart was generally large in these cases of cirrhosis. One heart was very large, and weighed 36 ounces; and two weighed 19 ounces; but in two of the males it was remarkably small—viz., 5¼ ounces and 6¼ ounces. The average weight of the heart of 14 of the males was 14·6 ounces, and of 4 of the females 12 ounces. Cirrhosis may co-exist with waxy degeneration. (See Case 514, VII. 21.)

19. Blood-staining (Sugillation) of Hepatic Veins and surrounding Liver-substance, 2 cases: Nos. 461, 534.—In Case 461, a woman, aged twenty-four, who died of typhoid fever, each pleural cavity contained about four ounces of very bloody serous fluid; the pericardium contained half an ounce of the same fluid, and was stained. All the cavities of the heart, and even the valves, were coloured dark-red by the blood. The large hepatic veins and the liver-substance immediately surrounding them were stained of a dark red colour; the liver-substance was for the most part pale and flabby, but the stained portions were softer than usual. Spleen, 10 ounces, soft. (See I. 11.)—Case 534, a woman, aged twenty-eight, who died of erysipelas of the head: the liver contained much dark fluid blood, the larger vessels

and surrounding liver-tissue were blood-stained; the heart, lungs, and kidneys contained much dark fluid blood.

20. Fatty Degeneration of Liver, 29 cases: Nos. 386, 390, 423, 430, 431, 434, 435, 438, 451, 452, 460, 462, 465, 472, 474, 478, 479, 506, 507, 509, 512, 520, 528, 532, 539, 544, 553, 558, 559. Of these 15 were males and 14 females. The average age of the 15 males was forty-four; the youngest nineteen, the oldest sixty-five. The average age of the 14 females was 40·7; the youngest twenty-five, the oldest sixty-five. The average weight of the liver of 14 of the males was 63·1 ounces; the largest was 90 ounces, the smallest 41 ounces. The average weight of the liver of 11 of the females was 61 ounces. The principal diseases of other organs co-existing with fatty liver were, tubercle of lungs in 10 cases; cicatrices or concretions in lung in 5; pleuritis in 5; hepatization of lung in 5; fatty heart in 4; granular kidneys in 10; cancer of breast in 4; cancer of tongue in 1; cancer of uterus in 2; cancer of external genitals in 1; and fever in 2 cases.

21. Waxy Degeneration of Liver, 5 cases: Nos. 392, 402, 426, 514, 538.—Of these, 4 were males and 1 was a female. The average age of these 5 subjects was thirty-three; the average weight of the liver of these 5 subjects was 78 ounces. Waxy liver was associated with disease of the hip-joint in 3 out of the 5 cases.—In Case 392, a boy, aged twelve, with disease of hip-joint, the liver weighed 60 ounces, was firm and mottled, and on section presented a shining straw colour, without any trace of natural structure. The spleen was firm and waxy;—there was no tubercle in the lungs.—Case 538, a lad, aged twenty, had tubercle of lungs and cavities, along with disease of hip. —Case 426, a man, aged forty-eight, had pericarditis and granular kidneys.—In case 402, a woman, aged forty-nine, who had cancer of the breast and of the lung, waxy degeneration and cancer occurred in the same liver; several large scirrhous masses, some about the size of a hen's egg, were scattered throughout the liver—a few were softened in the centre. The portions of liver not affected with cancer were firm and shining on section. Spleen, 11 ounces, firm and waxy.—In Case 514, a man, aged thirty-five, waxy degeneration co-existed with cirrhosis. The liver weighed 106 ounces, was very granular and puckered, and contained a few firm yellowish waxy masses.

22. Hyperæmia of Liver, 8 cases: Nos. 385, 387, 419, 437, 499, 503, 510, 534.—Hypertrophy of heart existed in 5 cases, tubercle of the lungs in 2 cases, and erysipelas of the head in 1 case.

23. Jaundice, 2 cases: Nos. 408, 491.—In case 408, a man, aged forty-two, the liver was infiltrated with medullary cancer, and scarcely any hepatic tissue was discernible.—Case 491, a man aged sixty-three, did not exhibit any marked hepatic disease. The liver was firm and of a yellow tinge; the bile was thick, but there was no other visible obstruction of the ducts. The pancreas was indurated; the kidneys were granular.

24. Perforation of the Gall-bladder, 1 case: No. 440.—For history of this case, see VI. 12.

25. Biliary Calculi, only noted in 4 cases: Nos. 440, 458, 494,

537.—In the case (440) of intestinal obstruction, produced by a biliary calculus, there were ten angular calculi in the intestine above the obstruction, and the liver-substance appeared healthy. In the other 3 cases the liver was granular; in 2 of these (458, 494) there was a single large round calculus in the gall-bladder; in Case 537, there were numerous rough masses of black inspissated bile in the gall-bladder, and one was seated in the cystic duct.

VIII. SPLEEN.

1. Hypertrophy of Spleen, 3 cases: Nos. 389, 406, 475.—In Case 389, a man, aged thirty-three, who had hypertrophy of the heart, the spleen weighed 14 ounces. Case 406, a man, aged fifty-three, occurred along with cancer of the liver, &c.; the abdominal viscera were all fixed by chronic adhesions; the spleen weighed 30 ounces, and was adherent to the diaphragm and abdominal parietes; its capsule was thickened. Case 475 occurred along with cirrhosis of the liver, ascites, and hydrothorax; the spleen weighed 32 ounces, was firm, dark, and glistening on section, and its capsule was thickened.

2. Cancer of Spleen, 1 case: No. 498.—This occurred along with cancer of the liver; the spleen weighed 5 ounces, was dark brown, and contained a white nodule the size of a pea, which exhibited the same structure as the tumour in the liver.

3. Waxy Degeneration of Spleen, 2 cases: Nos. 392, 402.—Case 392, a boy, aged twelve, had disease of hip-joint and waxy degeneration of liver. Case 402, a woman, aged forty-nine, died of cancer of the breast, liver, and lungs.

4. Fibrinous Deposits in Spleen, 3 cases: Nos. 419, 465, 488.—In Case 419, the spleen weighed 4½ ounces, and on section exhibited large, firm, irregular, fibrinous masses, of a yellowish white colour, its thin lower portion being almost entirely converted into this substance. (Museum, IX. 16; see I. 15.)—Case 465 occurred along with fibrinous plugging of the iliac artery and gangrene of the leg. (See IV. 5.)—Case 488, a man, aged thirty, who died of grey hepatization of the lungs; the heart and its valves were healthy; the spleen, though firm-looking on section, was black and friable, and presented three or four angular patches of yellow fibrinous deposit.

5. Abscess of the Spleen, 2 cases: Nos. 413, 434.—Case 413 (see I. 15) occurred along with phlebitis, which was produced by the pressure of enlarged cancerous lumbar glands on the vessels. The spleen presented three or four purulent spots containing small sloughs. —Case 434, a woman, aged sixty-five, who suffered from cancerous disease of the external genitals. The liver was fatty, and the kidneys were granular. The spleen was much enlarged, but the greater part was formed by an abscess, which yielded about half a pint of thin reddish pus and broken-up spleen-tissue; the portion of spleen which was not destroyed exhibited a part of the shaggy walls of the abscess.

6. Softening of Spleen, 1 Case: No. 502.—This condition was noted down in a case of poisoning by oil of bitter almonds, in which none

of the other organs were diseased. The spleen was "extremely soft and diffluent."

7. Chronic Adhesions of Spleen, 2 cases: Nos. 406, 477.

IX. KIDNEYS AND URINARY PASSAGES.

1. Atrophy of Kidney, 2 cases: Nos. 522, 533.—Both these occurred in women, along with cancer of the uterus, which was nearly destroyed by ulceration. In Case 522 the bladder was perforated, the left kidney weighed 2 ounces, and was hard and pale; in Case 533 the medullary cones had almost disappeared, the pelvis of the kidney was much dilated, and the cortical substance was very pale and tough.

2. Cancer of Kidney, 5 cases: Nos. 396, 406, 431, 489, 553.—Of these, 4 were secondary, following cancer of uterus, breast, lungs, and tongue, and 1 was primary, no other organ being involved. In this case (489) the cancerous growth of the kidney weighed *thirty-one pounds*, and occurred in a boy aged eight; all the other organs were tolerably healthy. This boy's abdomen soon after birth became larger than natural, and gradually increased in size. Twelve months before death, a tumour, about six inches in diameter, could be traced in the abdomen; it was slightly moveable, semi-elastic in some parts, and not painful on being handled. From this time the tumour increased so much in size, that he was soon unable to leave his bed. *On examination*, the parietes were firmly adherent to the tumour, the viscera much displaced. The anterior aspect of the tumour was found to consist of the concave portion of the left kidney, which was enormously enlarged; the ureter was of natural size. The kidney-tissue surrounding the renal pelvis appeared tolerably sound, and vertically measured 12 inches; beyond this, the tissue seemed converted into a thick fibrous layer, which quite surrounded the growth. The entire growth, when removed, weighed thirty-one pounds, and measured thirty-two inches in circumference transversely, and thirty-six inches in circumference vertically. On section, eight pints of dark, grumous, viscid fluid escaped, containing numerous yellowish, shreddy, sloughing masses; near the pelvis, the renal tissue was about one-third of an inch thick, but this became converted into a fibrous layer at about four inches from the pelvis, and as such extended all round the tumour.

The interior of the tumour presented a soft gelatinous, medullary substance, of a yellowish colour, with some patches of semitransparent material; and it was traversed by fibrous bands. Some portions were hanging in shreds and sloughs in all directions, but the breaking-up seemed furthest advanced at the part most distant from the pelvis, where it had, indeed, reached the distended fibrous layer which bounded the growth. The juice taken from different parts of the tumour exhibited large cells containing from one to three nuclei, spindle-shaped cells, &c. The right kidney weighed seven ounces, and exhibited no trace of disease.*

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* For further particulars and sketch, see Dr. Van der Byl's account, in the Transactions of the Pathological Society, vol. vii. p. 268. (Museum, X. 26.)

In Case 431, a woman, aged fifty-two, the lower half of the right kidney was involved in a nodulated fluctuating tumour, about the size of a fist; the upper half resembled the left kidney, which was granular. On section, the growth presented a medullary appearance, and seemed to have originated in the substance of the kidney, which was stretched over it, and converted into a fibroid capsule; the continuity of the cortical substance with this (so-called) fibroid capsule of the growth could be easily traced. This kidney weighed 16 ounces, and exactly resembled the large one above described. (Museum, X. 25.)

3. Tubercle of Kidneys, 4 cases: Nos. 404, 438, 492, 552.—All these cases were associated with tubercle of the lungs; in 2 cases there was also tubercular peritonitis.

4. Fibrinous Deposit in Kidneys, 6 cases: Nos. 419, 428, 457, 458, 464, 561.—In Case 419, the left kidney weighed three ounces and a half, and at its middle and anterior part presented a small depressed patch composed of firm yellowish substance, on the surface of which a few nodules of healthy-looking renal tissue were seen. The right kidney weighed only one ounce and a half; it was much deformed, and consisted for the most part of firm yellowish substance, very little of the renal structure remaining free from deposit. Fibrinous deposit occurred in the spleen. (See VIII. 4.)—Case 428 occurred in a woman, aged fifty-three, along with carditis and ulceration of the columnæ papillares.—Case 457, a man, aged twenty-eight, with hypertrophy and dilatation of heart.—Case 464 occurred in a man aged sixty, along with a cancerous growth in the bladder. In the kidney there were patches of a yellowish deposit, around and between the bases of the medullary cones.—In Case 561, a man, aged twenty-two, the left kidney on section exhibited several dark patches on the cortical substance; these patches were conical, with the bases superficial, and their centres were somewhat yellow and soft. The heart weighed 19½ ounces, the mitral orifice was much constricted, and a large, firm, adherent coagulum was found in the right auricular appendix.

5. Hyperæmia of Kidney, 4 cases: Nos. 393, 438, 448, 508. In 2 cases it is noted that the subjects had suffered from "diabetes."

6. Abscess, Suppuration, or Ulceration of Kidney (Nephritis), 5 Cases: Nos. 446, 460, 486, 487, 500.—Case 446, a woman aged twenty-eight, who had a villous (cancerous) growth in the bladder, about the size of an orange, which caused obstruction to the passage of the urine. The bladder was in a state of chronic inflammation; the kidneys on section presented numerous small abscesses in the cortical substances, arranged parallelly to the urinary tubes.—Case 460, a man aged fifty-five, who had stricture of the urethra and inflammation of the bladder. Both kidneys exhibited small irregular abscesses, surrounded by sanguineous exudation; in the cones the abscesses were elongated in the direction of the tubules.—In Case 486, a man, aged thirty-eight, with fungoid polypi in the bladder, the cones of the kidney presented several firm yellowish purulent streaks.—Case 500, a man, aged twenty-two, with caries of the spine, had a calculus impacted in the commencement of the right ureter. The left kidney,

contained a gritty material between the cones, and on scraping the surface yielded gritty purulent matter.

7. Cicatrices on Kidney, 1 case: No. 484.—A man aged twenty-five. The external surface of both kidneys was marked by deep cicatrices; on section, these were found to extend into the bases of the cones. The renal tissue is otherwise tolerably healthy, but the capsule is adherent to the areolar tissue, &c., surrounding the kidney.

8. Granular Disease of Kidneys, 38 cases: Nos. 384, 385, 386, 389, 407, 411, 414, 421, 425, 426, 427, 431, 432, 433, 434, 439, 440, 445, 454, 456, 459, 462, 469, 470, 471, 472, 474, 476, 478, 481, 485, 491, 504, 514, 522, 544, 546, 555.

9. Granular Disease of Kidneys, with Cysts, 7 cases: Nos. 387, 400, 417, 448, 480, 482, 499.—These two headings include all the different forms of Bright's disease or degenerative diseases of the kidneys; and it appears from these observations that granular disease of the kidneys is by far the most common morbid condition met with (or at least noted by us) in post-mortem examinations. It is doubtful in how many of these cases the disease was discovered before death; and although many cases did probably not exhibit symptoms of Bright's disease, yet this large proportion suggests the necessity of examining the urine more frequently.

10. Calculi in Kidney, 1 case: No. 500. (See IX. 6.)

11. Dilatation of Ureters, 3 cases: Nos. 432, 533, 548.—In case 432 (a woman, aged forty-five) the inferior half of the uterus was entirely destroyed by cancerous disease, which extended to the tissues at the back wall of the bladder, and involved the termination of the right ureter, producing its obstruction and dilatation to about the size of the ileum. Both kidneys were large, and remarkably pale and bloodless (Museum, X. 22).—Case 533, a woman, aged forty-four, who had cancer of the uterus; the pelvis of the kidney was also dilated, and the medullary cones were atrophied.—In case 548 there was also cancer of the uterus.

12. Ulceration, Thickening, Congestion, or Inflammation of Bladder, 5 cases: Nos. 390, 460, 486, 500, 548.

13. Medullary Cancer of Bladder, 1 case: No. 464.—A man, aged sixty. The bladder was much distended with large black coagula; a fungous tumour, the size of a walnut, was situated at the base of the bladder. This growth had a small neck, and was very vascular; on squeezing, it yielded an abundant milky juice, which under the microscope exhibited large delicate cells of various shapes, with distinct nuclei and nucleoli.

14. Villous Cancer of Bladder, 1 case: No. 446.—A woman, aged twenty-eight. Three years before death she was suddenly seized with pain in passing water, and pain in the loins; the urine was very bloody. This attack passed away, but she occasionally had a return of these symptoms, and at length the symptoms increased in severity, the urine generally containing much mucus and blood. Four months before death the hæmorrhage from the bladder became almost constant; she began to loose flesh, and died after extreme suffering. The coats

of the bladder were much thickened; its mucous membrane was dark blue. A villous growth of a bright red colour, the size of an orange when floated out in water, was fixed near the front of the bladder, and two smaller ones were situated near it. To the naked eye these resembled the chorion in structure when floated in water; and microscopic examination exhibited a striking similarity in appearance with the villi of the chorion.*

15. Hæmorrhage into Bladder, 3 cases: Nos. 446, 464, 478.—Case 446 was produced by villous disease of bladder (see IX. 14); and Case 464 occurred along with medullary cancer of bladder (see IX. 13).—In Case 478, a man, aged twenty-nine, the bladder contained a black clot the size of an egg, slightly flattened; the mucous membrane of the bladder was much congested, and a small vessel appeared to have been ruptured in it. The kidneys were very granular; the liver was fatty.

16. Polypus of Bladder, 1 case: No. 486.—A man, aged thirty-eight. When the bladder was opened, its internal surface presented several polypous growths, which appeared congested; one was much softened, and resembled a mashed mulberry. The bladder was much contracted, and surrounded by thickened and indurated areolar tissue, along with inflammatory exudation and pus; on removing it, much purulent matter escaped from some abscesses between it and the rectum, but there was no pus in the bladder; abscesses occurred in the kidneys. (See IX. 6.)

X. GENITAL ORGANS AND MAMMARY GLANDS.

1. Cancerous Sloughing of External Genitals, 1 case: No. 434.—A woman, aged sixty-five, who had also abscess of the spleen. (See VIII. 5.)

2. Cancerous Sloughing of Vagina, 1 case: No. 409.—A woman, aged forty-six, who had cancer of the uterus.

3. Fibrous Tumour of Uterus, 3 cases: Nos. 422, 434, 508.—Case 422 occurred along with dropsy of the Fallopian tubes (see X. 6). The tumour was the size of a pigeon's egg, and was situated in the cervix.—In Case 434, the tumour occurred along with cancerous sloughing of the external genitals (see X. 1).—Case 508, a woman, aged fifty. The tumour was the size of an orange, and was situated at the back of the fundus, which was itself bent backwards; the os uteri was also directed backwards.

4. Cancer of Uterus, 16 cases: Nos. 382, 396, 409, 411, 413, 414, 431, 432, 468, 479, 517, 522, 533, 548, 556, 558. The average age of these 16 subjects was forty-seven; the youngest was aged thirty-two, the oldest sixty-five. The other organs also affected with cancer were—the liver in 4 cases; lungs in 2; kidneys in 2; pylorus and diaphragm in 1 case. The other diseases co-existing with these 16 cases of cancer of the uterus were, granular disease of kidneys in 4 cases; dilata-

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* For further particulars, see Mr. Sibley's account in the Transactions of the Pathological Society, vol. vii. p. 257.

tion of the ureters in 3; fatty heart in 2; fatty liver in 3; inflammation of the bladder in 1 case; perforation of the bladder in 1; peritonitis in 3 cases; phlebitis in 1 case; sloughing of vagina in 1 case.

5. Ovarian Cyst, 1 case: No. 409.

6. Fallopian-tube Dropsy, 1 case: No. 422.—A woman aged thirty-seven, who died of bronchitis and emphysema, and had a fibrous tumour of the uterus (see X. 3). The Fallopian tubes on both sides were greatly distended with fluid, and convoluted; they were partly adherent to the back of the uterus; the ovaries were not involved. (Museum XIII. 45.)

7. Cysts in the Uterus, 3 cases: Nos. 425, 462, 552.—Cases 425 and 462 had cancer of the breast; Case 552 had tubercle of the lungs. In all these cases the cysts were small, not larger than a hazel-nut; in 1 case they were situated in the cervix, in 1 in the cervix and back of the uterus. In all the 3 cases the contents were glue-like or jelly-like, semi-transparent, and of a yellowish colour. This may, I think, be called *benign colloid*, to distinguish it from the cancerous disease, or malignant colloid.

8. Polypus of Uterus, 2 cases: Nos. 425, 462.—These co-existed with cysts in the uterus. In both cases the polypi were small; the largest was about the size of a cherry, and was hanging from the os uteri. (Museum XIII. 46.)

9. Anteflexion of Uterus, 1 case: No. 473.

10. Puerperal Endo-metritis, 1 case: No. 435.—For history, see IV. 9.

11. Catarrh of Uterus, 1 case: No. 386.—This is only noted once, and occurred along with cancer of the breast. It is probably a common affection, and if looked for would be found more frequently.

12. Phlebolites in Prostatic Veins, 1 case: No. 390.—A man aged thirty-eight, who had suffered from tertiary syphilis and emphysema. His bladder was in a state of chronic inflammation. The phlebolites were about the size of grains of pearl-barley, and had a yellowish colour.

13. Cancer of Breast, 9 cases: Nos. 386, 399, 402, 425, 431, 462, 467, 479, 557.—The average age of these subjects was 49·3. In 4 cases the disease had extended through the anterior walls of the thorax, and involved the pleura and pericardium; in three cases the lungs were involved.—In Case 425, there was also colloid disease of the peritoneum.—In Case 462, a woman aged fifty-three, the cancer had entirely destroyed the wall of the thorax, and formed an opening into the cavity of the pleura about three inches in diameter. The disease had begun as scirrhous tumour of the right breast six years before death; in three years the skin had ulcerated, and the glands in the axilla become indurated. Subsequently, the skin around the mamma became condensed, adherent to the parts beneath, and studded with cancerous nodules; the disease next extended to the left breast, and hard tumours formed in it. Ulceration and sloughing advanced rapidly on the right side, and formed a very large wound; erysipelas supervened, and was succeeded by a tendency to cicatrization. But

the disease soon resumed its activity, and six weeks before death a thick slough formed over the fourth and fifth ribs, near their junction with the cartilages. When this slough became detached, a direct opening was formed into the cavity of the pleura, and portions of the fourth and fifth ribs were destroyed. On *examination*, the right lung was found adherent to the anterior thoracic parietes, but leaving a free space around the opening, varying from one to four inches, so that a cavity was formed which might contain about two pints. The surface of the lung was covered with very offensive purulent lymph.* (Museum, XVIII. 17.)

XI. PERITONEUM AND DIAPHRAGM.

1. Pus or Sero-Purulent Fluid in Peritoneum (Peritonitis), 6 cases: Nos. 418, 435, 512, 515, 529, 560.—These were connected with perforating ulcer of the stomach and perforation of the diaphragm in 1 case; puerperal endo-metritis in 1 case; perforation of the intestine in 2 cases, of which 1 was with typhoid fever; tubercular peritonitis in 1 case; and ileus in 1 case.

2. Pus in Circumscribed Cavities in Peritoneum (Circumscribed Peritonitis), 5 cases: Nos. 437, 440, 468, 548, 558.—These occurred along with ulcer of the rectum in 1 case; intestinal obstruction in 1 case; and cancer of the uterus in 3 cases.

3. Tubercles and Lymph on Peritoneum (Tubercular Peritonitis), 5 cases: Nos. 404, 492, 501, 525, 529.—These were connected with tubercles in the lung in 4 cases; and tubercular ulceration of the intestine in 2 cases; in 1 case only there was no tubercle in the lungs.

4. Chronic Adhesions of Abdominal Viscera, 3 cases: Nos. 406, 416, 477.

5. Excess of Serous Fluid in Peritoneum (Ascites), 9 cases: Nos. 408, 415, 416, 420, 451, 453, 475, 503, 516.—These were associated with hypertrophy of the heart in 4 cases; fatty heart and bronchitis in 1 case; cancer of the liver in 1 case; cirrhosis in 1 case; and chronic peritonitis in 2 cases.

6. Colloid Cancer of Peritoneum, 1 case: No. 425.—A woman aged sixty-four, who had medullary cancer of the breast, cancer of the pleura, pericardium, and phrenic nerve. (See II. 3.) The great omentum contained a number of semi-transparent nodules, about the size of a pea to that of a hazel-nut; on section, some were firm, like vegetable jelly, others yielded a yellow glairy fluid, which appeared to be contained in a cyst or sac. The mesenteric glands were enlarged; the peritoneal covering at the back of the uterus contained several minute cysts containing a soft yellow transparent jelly; but I am inclined to consider this "*benign* colloid," for similar cysts occurred in the cervix of this uterus, and in a uterus from a subject who died of phthisis. (See X. 7.)

7. Perforation of the Diaphragm, 2 cases: Nos. 418, 494.—Case 418, a woman aged twenty, had suffered occasional vomiting and

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* For further particulars see Mr. Shaw's account in the Transactions of the Pathological Society, vol. vii. p. 45.

frequent pain in the abdomen for twelve months. The abdomen then became very tender, rather hard, and more painful than usual; she had great thirst; the pulse was 136; the countenance expressive of much distress. Vomiting recurred frequently, the abdomen became more distended; she suffered from loss of appetite, short hacking cough, and sleeplessness. At length, absence of vesicular respiration was discovered in the lower and anterior part of left chest, where very large crepitation and metallic tinkling were heard. On examination, the abdominal parietes were found firmly adherent to the transverse colon, on a level with the umbilicus; above this, the anterior wall of the abdomen was adherent to the liver, spleen, &c., and formed the anterior boundary of a circumscribed cavity, which was opened by the first incision in the middle line, and yielded a copious discharge of laudable pus. This cavity was bounded behind by the stomach, duodenum, and left lobe of the liver; above, by the diaphragm; below, by the colon; and on the left by the spleen. To the right of the duodenum, and below the posterior thick border of the liver, was a smaller cavity, which communicated by means of two jagged openings with the duodenum. Several still smaller cavities could be made out between the viscera, and all these contained thick greenish-yellow pus. Below the transverse colon the abdominal parietes were not adherent to any of the viscera; the great omentum covered the intestines, and was nowhere adherent; the transverse meso-colon, &c., formed a firm and well-defined boundary. The large cavity first described must have contained about a pint of pus, and when this was removed, it was found to have two important communications—one with the stomach, by means of an opening about an inch and a half in diameter, presenting a punched appearance, and the other with the left pleural sac by means of several ragged openings through the diaphragm. The *opening into the stomach* was situated on its anterior surface, near the œsophageal end of the lesser curvature of the stomach, and presented the punched appearance of a perforating ulcer, with a smooth margin, the internal lapping outwards. The anterior surface of the stomach was partly covered with a thick layer of purulent lymph, hanging in shreds; near the cardiac end, on the external surface of the stomach, were situated two round ulcers, presenting a punched appearance; the muscular coats were entirely destroyed, but the larger one, about an inch and a half in diameter, had only a minute opening in the mucous coat; and the smaller ulcer had the mucous membrane protruding in a hernial manner, but quite free from disease; a much smaller ulcer was situated near each of these two ulcers, and presented similar characters, less advanced. The posterior surface of the stomach was not covered with lymph; the mucous membrane of the stomach appeared in other respects healthy. The portion of the diaphragm which formed the upper boundary of the large purulent cavity exhibited a shaggy, torn appearance; tendinous bands crossed in different directions, and the muscular fibres were hanging down in shreds. The *perforations of the diaphragm* were situated in front, and to the left of the œsophageal opening, in the angle between the middle and left portions of the central tendon of the diaphragm. Two perforations were about an inch in length, and two smaller about half an inch. They communicated with a purulent cavity above the diaphragm, which was situated to the left of the pericardium, and was formed by the margins of the base of the lung having adhered to the upper surface of the diaphragm. This cavity contained about ten ounces of fœtid pus; the diaphragm reached nearly to the fourth rib on the left side. The liver weighed 86 ounces; the anterior surface of the left lobe was covered by a thick layer of purulent lymph, which extended to the suspensory ligament, beyond which the anterior surface of the liver was adherent to the abdominal parietes, and formed the right boundary of the large purulent cavity. The liver-tissue was greenish blue beneath the layer of purulent lymph, at other points it was pale and rather shining on section. The spleen was partly covered with purulent lymph; the kidneys were large, pale, and flabby. The lungs were free from disease, excepting the base of the left, which was slightly carnified. The heart was tolerably healthy, the valves were sound.

Case 494, a woman aged sixty-three, who had purulent effusion into the right pleural cavity. Two years before death she had jaundice, and was never well afterwards. During the last fourteen months she had great pain in the loins and lower extremities, and was sometimes not able to walk for two or three weeks together. During the last fortnight before death she complained of cough, debility, and pain in the hepatic region. There was marked dulness on percussion about the base of the right lung, where the respiration also was deficient; the countenance jaundiced and haggard. On opening the right pleura an offensive gas escaped, and the cavity was found to contain four pints of a dirty yellowish fœtid fluid. The lung was pressed upward and against the spine; the costal and pulmonary pleuræ were covered with thick layers of purulent lymph. On removing the liver, it was found that the diaphragm had been perforated near the spine on the right side, and that the purulent fluid had been in contact with a portion of the thick posterior border of the liver. There was no appearance of any abscess of the liver; on section, the liver-tissue appeared granular.

XII. Lymphatic and Lacteal Glands.

1. Cancer of Cervical Glands, 2 cases: Nos. 476, 533.
2. Cancer of Lumbar Glands, 5 cases: Nos. 382, 406, 413, 533, 556.
3. Cancer of Inguinal Glands, 3 cases: Nos. 394, 396, 433.

Cancer of the cervical, lumbar, and inguinal glands, was always associated with cancer of some neighbouring organ.

4. Hypertrophy of Bronchial Glands, 4 cases: Nos. 407, 436, 437, 536.—In Case 407, a man aged fifty-one, who had cancer of the liver and stomach, the bronchial glands were very large and soft, as if from scrofulous deposit.—In Case 536, a little girl aged two years and a half, who was afflicted with general struma, the bronchial glands

were enlarged by tubercular deposit to the size of a hen's egg, and produced pressure on the bronchi and consequent difficult breathing.

5. Colloid Cyst in Bronchial Gland, 1 case: No. 396.

6. Tubercle of Bronchial Glands, 6 cases: Nos. 437, 442, 493, 530, 532, 536. This number is doubtless below the actual proportion, although it includes one of the above cases of hypertrophy.

7. Tubercle of Mesenteric Glands, 1 case: No. 536.

8. Chalky Concretions in Mesenteric Glands, 1 case: No. 531.

9. Typhoid Deposit in Mesenteric Glands, 1 case: No. 391.

XIII. BONES AND JOINTS.

1. Pus beneath Periosteum of Tibia, 1 case: No. 427.

2. Purulent Mucus in Sphenoidal Sinuses (Disease of Bone), 1 case: No. 456.

3. Disease of Bones within the Nose, 1 case: No. 397.

4. Pelvic Abscesses, 1 case: No. 486.

5. Cancer of Skull, 2 cases: Nos. 480, 498. In Case 480, the disease began in the antrum (Museum IV. 43^a); in Case 498, the primary disease was cancer of the liver, but the sternum, spine, and humerus, were also involved. In both these cases the dura mater was also affected. (See I. 1.)

6. Cancer of Antrum, 1 case: No. 480.

7. Cancer of Spine, 1 case: No. 498.

8. Cancer of Sternum, 1 case: No. 498. (Museum IV. 35^d.)

9. Cancer of Ribs, 1 case: No. 382. (Museum IV. 35^b.)

10. Cancer of Humerus, 1 case: No. 498. (Museum IV. 36^d.)

11. Caries of Spine (Angular Curvature), 1 case: No. 500.

12. Lateral Curvature of Spine, 1 case: No. 381.

13. Necrosis of Vertebræ, 1 case: No. 388.

14. Disease of Hip-joint, 3 cases: Nos. 392, 426, 538.

15. Disease of Knee-joint, 3 cases: Nos. 445, 495, 506.—In Case 445, a man aged fifty, the cartilages were entirely destroyed; the bones were bare and rough, and yielded an offensive odour; there was partial dislocation, the lungs contained a quantity of tubercle, and the intestines were involved in tubercular ulceration.—Case 495, a man aged twenty-four, in whom excision of the knee had been performed. On examination, the wound was in a suppurating condition, and yielded a most offensive odour. Fibrinous deposits occurred in the lungs and liver.—Case 506, a lad aged nineteen; amputation of the thigh had been performed for ulceration of the cartilages of the knee. On examination, no purulent deposits were found; the saphenous and femoral veins were perfectly healthy; the lymphatic glands of the groin and pelvis enlarged and soft. There was hypostatic congestion of the lungs; also fatty degeneration of liver, granular kidneys, and adherent pericardium.

16. Fracture of Skull, 2 cases: Nos. 518, 521.

17. Fracture of Tibia and Fibula, 1 case: No. 403.—A lad aged fourteen years and a half; the fracture was compound and comminuted. He died of hepatization of the lungs.

18. Fracture of Neck of Femur, 1 case: No. 450.—A woman aged eighty-one; the fracture was external to the capsule, passed through the anterior intertrochanteric line, and the fossa at the base of the great trochanter; the trochanter was split downwards; the fractured bone was surrounded by a large quantity of purulent matter.

XIV. EXTERNAL APPEARANCES, SKIN, ETC.

1. Burn of Scalp and Hand, 1 case: No. 429.
2. Burn over Knee, 1 case: No. 477.
3. Ulcer of Leg, 1 case: No. 547.
4. Gangrene of Leg, 1 case: No. 465. This was produced by fibrinous plugging of the common iliac artery. (See IV. 5.)
5. Erysipelas, 4 cases: Nos. 386, 405, 534, 544.—Case 386 occurred after excision of a cancerous tumour of the breast.
6. Abscess in the Neck, 1 case: No. 388.
7. Fistula in Ano, 2 cases: Nos. 438, 528.—Both these were associated with phthisis.
8. Amputation of Arm, 1 case: No. 519.—A man aged forty-four; death was caused by pleuritis and carnification of the lung.
9. Amputation of Thigh, 1 case: No. 506.—This was performed for disease of the knee-joint. (See XIII. 15.)
10. Excision of Knee-joint, 1 case: No. 495. (See XIII. 15.)
11. Psoriasis, Secondary Syphilis, 2 cases: Nos. 390, 526.
12. Jaundice, 2 cases: Nos. 408, 491. (See VII. 23.)
13. Anasarca (general Dropsy), 2 (extreme) cases: Nos. 516, 537.

ART. II.

An Experimental Inquiry into the Function of the Supra-Renal Capsules, and their Supposed Connexion with Bronzed Skin. By GEORGE HARLEY, M.D., F.C.S., of University College, London.

(Continued from No. 41, p. 221.)

Pathology of the Supra-renal Capsules.

COMPARATIVELY little attention has been paid to the pathology of the supra-renal capsules. All that we as yet know is, that they, like other organs, are liable to a variety of organic changes, such as cancerous, calcareous, and tuberculous deposits, as well as fatty and fibrous degeneration. With regard to their functional derangements, we know absolutely nothing. As it happens that at the present moment the question of the connexion existing between bronzed skin and supra-renal capsular disease is agitating the whole medical world, both here and abroad, and as I consider it still *sub judice* whether or not bronzing of the skin ought to be regarded as a pathognomonic symptom of diseased supra-renal capsules, it may perhaps be advisable for me to add a few remarks upon the subject.

Since the publication of Dr. Addison's interesting monograph 'On the Constitutional and Local Effects of Disease of the Supra-renal Capsules,' many cases similar to those he described have been reported, both in home and foreign journals. At the present moment the facts of the case seem to be the following:—A certain number of cases have been observed where bronzing of the skin and disease of the supra-renal capsules have been found associated together, and from that it has been concluded by some that the one was dependent on the other state. Now, let me ask if the mere fact of supra-renal capsular disease and bronzing of the skin being found associated together, is sufficient to justify us in regarding the latter as a pathognomonic symptom of the former? Add to these textural changes the functional symptoms of anæmia, debility, languor, feebleness of the heart's action, and irritability of the stomach, and have we then incontestable evidence that bronzing of the skin so accompanied is the result of supra-renal capsular disease? Do we require no further data to be laid before us ere we pronounce judgment? Surely every one will agree that this is but one side of the question, and that before we can decide it, the other must also be examined.

In order to consider the subject properly, it will be necessary for us to proceed in a categorical manner.

The principal points to be ascertained are—*Firstly*, Is supra-renal capsular disease invariably accompanied by bronzed skin? and, *secondly*, is bronzed skin always associated with disease of these organs?

At the time when Dr. Addison published his monograph, as well as in October, 1856, when a review of it appeared in this Journal, a number of cases had been recorded in which a bronzed condition of the skin was found concomitant with total destruction of the supra-renal capsules; one or two cases where partial disease of these organs occurred, and in these bronzing of the skin was sometimes present, sometimes absent; but not a single case was at that time on record in which total destruction of the supra-renal capsules existed without manifest discoloration of the skin. And still farther, no case of bronzing of the skin had been published in which the capsules were found healthy. So that the conclusions come to by these gentlemen at the time they wrote might be considered as legitimate. At the present moment, however, the case is very different, several cases have been reported in various journals where extensive and even total destruction of the supra-renal capsules existed unaccompanied by any discoloration of the skin. In proof of this I may cite the following 12 examples:

Professor Friedreich relates a case of extensive amyloid degeneration of the supra-renal capsules, without a trace of bronzing of the skin. He says that the organs were of the normal size, but unusually hard. On being cut into, the brown cortical pigment-zone was found entirely absent. On microscopical examination, this part of the organ was seen to be full of fat granules. The medullary substance was even in a still more advanced stage of degeneration; the greater part of the cells being transformed into homogeneous glittering masses—a fact, as the author remarks, of particular importance in connexion with the absence of any discoloration of the skin.*

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* Virchow's Archives, April, 1857, p. 389.

Professor Friedreich, in the same paper, mentions still another case, in which the supra-renal capsules were found of twice their normal size, and extensively affected with amyloid degeneration. The microscopical characters were similar to those mentioned as occurring in the other specimens, and yet there was no discoloration of the skin.

At one of the meetings of the Bath and Bristol Association, Mr. Davis reported two cases that he had met with of extensive disease of the supra-renal capsules, without any bronzing of the skin.* The one patient died of heart, the other of kidney, disease.

Professor Virchow writes me, that he has met with several cases of tubercular deposit in one or both supra-renal capsules, unaccompanied by bronzed skin. He mentions one case in particular, in which both capsules were completely destroyed by cancerous deposit, without the slightest discoloration of the skin having been observed.

I have myself examined one case of complete degeneration of the supra-renal capsules without any bronzing of the skin having been noticed. The patient died in the Middlesex Hospital, and his supra-renal capsules were kindly forwarded to me by Dr. Van der Byl. The capsules at first sight appeared healthy. On being cut into, however, the sinuses in the medullary part were found all united into one, so as to form a tolerably large cavity, which contained a dark grumous-looking liquid. On this fluid being examined with the microscope, it was seen to contain a number of blood corpuscles, pigment granules, oil globules, and broken-up nucleated cells,—most probably, part of the *débris* from the medullary substance, which was found no longer to possess its normal histological structure. The cortical portion of the capsules was of a dingy yellow colour, soft, and exceedingly friable; so much so, that on attempting to make a thin section of it with the knife, it crumbled away before the cutting edge. On placing a small portion under the microscope, there was neither the slightest trace of loculi nor fibrous matrix visible; nothing but a confused mass of cells, granules, and fatty matter could be detected. In fact, it was almost entirely composed of fat globules and granules.† For the following notes of the case I am indebted to Dr. Van der Byl:

"The patient (a man aged forty) was of thin make of body and sallow complexion, with several cicatrices of scrofulous abscesses about the hips, axillæ, and neck. His lungs were attacked with inflammatory disease. Most of the internal organs contained a large quantity of fat. The heart, on microscopical examination, showed the existence of many fatty molecules, although the transverse striæ were visible in the greater number of the fibres. The liver weighed 11 pounds 13¼ ounces, and had a pale-yellowish appearance. The lobules were not distinguishable. [The cells of the liver were crowded with fatty matter.—G. H.] The spleen weighed 25 ounces, and resembled 'waxy spleen,' &c. &c. No bronzing of the skin was observed."

At the late meeting of 'Naturforscher und Ärzte,' at Bonn, Dr.

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* British Medical Journal, Feb. 28th, 1857.

† For the benefit of those not accustomed to examine the supra-renal capsules microscopically, I may remark, that about fifty per cent. of the human supra-renal capsules have their cells more or less filled with oil globules, so that great caution is required in their examination, otherwise many healthy organs may be regarded as diseased.

Klob, assistant to Rokitansky, mentioned a case of well-marked degeneration of the supra-renal capsules, in a man whose white skin and fair hair had undergone no change in colour.

Dr. John Ogle has reported a case in which both of the supra-renal capsules were extensively occupied by scrofulous deposit, without any bronzing of the skin. The patient, a girl aged fourteen, died in St. George's Hospital of pulmonary phthisis.

> "Both capsules were greatly thickened, and in each case but a very small amount of natural tissue existed, the remaining parts of the capsule being the seat of a firm yellowish-white deposit, which quite obscured the proper texture of the organ, and had every external appearance of scrofulous deposit in what has been termed the 'crude form.' One supra-renal capsule weighed eight scruples, the other seven scruples. . . . .
>
> "*Microscopical appearances.*—Those parts of the supra-renal capsules which were not the seat of foreign deposit, presented none of the natural large and oval bodies which that organ naturally contains, but instead, numbers of round and oval bodies, like white corpuscles of the blood, along with some curled and nucleated fibres. The deposit showed large numbers of ill-defined, non-nucleated cell-structures interspersed amidst quantities of granular and fatty matter."*

Drs. Peacock and Bristowe have reported a case of cancer of the supra-renal capsules, and of the other organs, with no discoloration of the skin. Patient was a female, aged seventeen.

> "A very careful examination was made, but no appearance whatever of healthy supra-renal glands was detected, so that there was no doubt that the whole or a part of each of the masses was due to cancerous disease of these organs. In each case a portion, about as large as a chesnut, could be pointed out as being indubitably a part, at least, of the bodies in question. These portions were rather firmer and more fibrous than the surrounding cancerous growths; though to the naked eye they presented some of the characters of healthy supra-renal capsules, yet under the microscope they displayed little else than the elements of cancer, such as they existed in the other organs."†

Drs. Peacock and Bristowe have reported still another case of complete cancerous degeneration of both supra-renal capsules, where "none of the normal tissue was detected," without any discoloration of the skin.‡

Rokitansky mentions that not unfrequently the supra-renal capsules are entirely absent.

An interesting case of this sort is described in Jones and Sieveking's 'Pathological Anatomy.'

> "A careful search was made for the supra-renal capsules in the body of a child six years old, who had died from a burn. No trace of them could be found, but a small quantity of large, dirty-looking, reddish, infiltrated, areolar tissue, which presented under the microscope only a mixture of altered granulous nuclei, large granulous or oil-holding cells, and a very large quantity of diffused granulous matter imbedding some oil-drops. This was a case of unusually early atrophy."

I may cite another very curious case reported by Professor Martini of Naples. A man aged forty, the father of three children, died of phthisis in one of the Neapolitan hospitals. On post-mortem examination, the supra-renal capsules were found entirely wanting. Yet, as the author remarks, notwithstanding this, the skin of the patient was remarkably white for an Italian.*

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* Transactions of the Pathological Society, vol. viii. p. 330.

† Ibid., pp. 336, 337.

‡ Pathological Anatomy, p. 589.

A number of cases have been reported in the journals, where only one supra-renal capsule was diseased (see cases mentioned by Ogle, Hutchinson, Wilks, Murchison, and others), and where bronzed skin was sometimes present, sometimes absent, but I refrain from mentioning them, as they throw no light upon the subject. As I think the cases that I have here quoted suffice to give a negative answer to the question, "Is disease of the supra-renal capsules invariably accompanied by bronzed skin?" I shall now proceed to the consideration of the next question—namely, Is bronzed skin always associated with disease of the supra-renal bodies?

M. Puech communicated to the French Academy† the case of a man, aged fifty-four, whose skin for a year and a half before death was observed to become gradually darker in colour. This change of tint was accompanied by loss of strength, bad digestion, alternate diarrhœa and constipation. During a short interval he slightly improved, but afterwards he was seized with pain in the right iliac region, followed by black and fœtid stools. He ultimately died of peritonitis from perforation of the intestine. In this case, the bronzing of the skin was most decided upon the face, breast, abdomen, and anterior and interior of the thighs. M. Puech, and others who saw the patient, expected to find diseased supra-renal bodies. The post-mortem examination, however, undeceived them. The author's own words are, "Les capsules surrenales, minutieusement examinées, n'offrent pas la moindre alteration."

Dr. Fricke has published the case of an Irishman, aged twenty-five, who in the latter part of 1856 complained of debility, nausea, headache, and constipation. A month afterwards this man was attacked with jaundice, from which he gradually recovered. Last January (1857) it was noticed that he had bronzing of the skin. It gradually became more decided. On the 29th of April last the man died, and on post-mortem examination his supra-renal capsules were found of the normal size, hue, and consistence, presenting no alteration whatever. There was very marked cirrhosis of the liver.‡

Dr. Luton mentions a case of bronzed skin in a patient who died of phthisis. The supra-renal capsules were carefully examined. The right weighed 3 grammes (= 46½ grains); the left weighed 3½ grammes (= 53 grains). They were quite normal in volume, in colour, and in structure. While in Edinburgh last summer, Professor Simpson mentioned to me that he had had a patient who presented a peculiar discoloration of the skin. The post-mortem examination, however, revealed healthy supra-renal capsules. The following notes of the case were kindly furnished to me by Dr. Alexander Simpson. The patient was a young girl aged fourteen. She had a tumour in the upper part of the abdominal cavity, most pronounced in the left hypochondrium. The trunk of the body and the arms were discoloured; the tint was more yellowish than brown, and was darkest in front of the axillæ. She ultimately died of phthisis. The liver and spleen—particularly the latter—were enormously hypertrophied. The left supra-renal capsule seemed perfectly normal, and so was the right, with the exception of a small tubercle, about the size of a mustard-seed, on its anterior surface.

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* Comptes Rendus, Dec. 1st, 1856.

† April 6th, 1857.

‡ North American Medico-Chirurgical Review, July, 1857; also the October number of this Journal.

At one of the meetings of the Reading Pathological Society, Mr. George May presented supra-renal capsules which before death were supposed to be diseased, from the brown colour of the skin and other diagnostic signs. In January (1857) he was first called to see the patient —a male forty-six years of age—who had congenital blindness, but who, with the exception of slight attacks of gout, had enjoyed good health. His breathing became hurried, and he was easily fatigued, which was the more remarkable as he was accustomed to much exercise. The tongue was pale and furred, pulse feeble, and the rest much disturbed. The discoloration of the skin was most marked in the face, neck, axillæ, arms, and legs. Some brown patches, about the size of a pea, were scattered over the body. He gradually got weaker, and after suffering from cough, vomiting, and diarrhœa, he died in a convulsive and comatose state. On examination after death, the renal capsules were perfectly *normal*, the kidneys small, the left ventricle of the heart dilated, and the lungs emphysematous. The twin brother, born blind, died much in the same state eighteen years ago.

Last winter Mr. Hutchinson showed to the London Pathological Society two perfectly healthy supra-renal capsules that had been taken from a man with bronzed skin. The man, aged twenty-five, died after a short illness in the Royal Infirmary at Liverpool.*

The following notes of a case of bronzed skin without supra-renal capsular disease, were kindly sent to me by Professor Virchow. The skin was of a very dark grey-brown colour, with here and there mottled patches. At first sight the man might have been mistaken for a native of the tropics, or the descendant of some coloured race. He was, however, a Saxon. No trace of disease was detected in his supra-renal capsules. Professor Virchow adds, that he has not as yet met with any case favourable to the theory of bronzed skin depending on supra-renal capsular disease. (Letter dated 15th November, 1857.)

Having now seen that disease of the capsulæ supra-renales is not invariably accompanied by bronzed skin, as well as that discoloration of the skin is not always associated with supra-renal capsular disease, two other questions may be proposed. Firstly, Is bronzing of the skin the result of one particular disease, or class of diseases, affecting the supra-renal bodies? This question is easily answered, for Dr. Addison and others have found bronzing of the skin associated with cancer, tubercle, and a variety of other diseased conditions of the capsules. The peculiar discoloration of the skin, therefore, cannot be looked upon as the result of any particular disease of these organs. Secondly, Is bronzing of the skin a consequence of the supra-renal capsular function being suppressed? With regard to this point Dr. Addison observes, in one of his published cases, "This would render it probable that the excess of dark pigment, so characteristic of renal capsular disease, depended rather upon an interruption to some special function than upon the nature of the organic change." I think my readers will scarcely be disposed to agree with this inference, when they remember that in the foregoing cases we found discoloration of the skin existing where the capsules were ascertained to be healthy, and absent in some of those cases where the organs were found so extensively diseased that their function, whatever it may be, must have been entirely interrupted.

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* Transactions of the Pathological Society, vol. viii. p. 341.

The various questions already considered having all received negative answers, it may now be asked—WHAT IS THE CAUSE OF BRONZED SKIN? To this question I find it very difficult to reply. For as yet we know but very little regarding the chromatogenous function of the animal economy. In glancing at the animal kingdom, we cannot fail to be struck with the great difference of colour existing in the various species of animals, and even in different members of the same species. Take, for example, the human family, and we find every shade of tint, from the fair complexion of the inhabitants of the temperate, to the jetty black of those of the torrid zone. How are we to explain the cause of this difference in the distribution of the cutaneous pigment in the human race? The action of light and heat has undoubtedly something to do with it, but that cannot be regarded as the sole cause. For although a white man becomes very dark after many years' exposure to the sun in the tropical zone, yet he never acquires the tint of the negro; nor does the latter, after a prolonged sojourn in a temperate climate, ever obtain a fair skin. It is scarcely necessary to remark, that the sun's rays are a powerful stimulant to the formation of pigment in the human skin. Every one is aware that the blond complexion during the summer months often becomes of a swarthy hue, while at the return of winter the pigment is reabsorbed, and the skin regains its former whiteness.

In the case of some of the lower animals, we have a still more beautiful illustration of the direct effects of light upon the deposition of pigment. The proteus, for example, that curious inhabitant of the dark caves in Styria, when first brought into the light is of a most beautiful transparent flesh colour, and after a few days' exposure to the sun's rays it becomes of a dark hue. The cause of the change of colour in this creature appears to be the chemical action of the sun's light. In the case of man, however, there are some other things to be taken into account. For we find that individuals of equally blond complexions subjected to a similar amount of exposure to the sun, are tanned in different degrees; one, perhaps, becoming of a dark-brown, while another is scarcely tinged. Again, we may even find that in the same individual the skin becomes unequally darkened, as in the case of freckled persons, in consequence of the pigment being irregularly deposited. These facts clearly prove that the deposit of colouring matter in the human skin is not wholly dependent upon external agencies. Recent researches have shown that the colour of some of the lower animals may be modified by the direct application of different chemical agents to the cutaneous surface, as well as by galvanic stimulants applied to the nerves. Wittich* found, for example, when he irritated a frog's skin by touching it with acids, alkalies, or turpentine, that it immediately became of a lighter hue; and that by galvanizing the trunks of the cutaneous nerves, a similar effect was produced. This he explained by saying, that these agents acted by causing the pigment cells to contract.† Then, on the other hand, certain animals have the power of changing their colour at will; a noise or a gentle touch will cause the chameleon to change its hue. This fact J. S. Gaskoin, Esq., and I, saw beautifully illustrated the other day at the Zoological Gardens. While we were looking at one of the chameleons, which was of a pale-green colour, striped with brown after the manner of a zebra, it happened to be touched by its keeper, and immediately afterwards we noticed its skin become gradually darker, until at last the brown stripes were replaced by others approaching almost to black, and the pale-green to a sombre slate colour. Brücke says, that the change of the chameleon's colour is dependent upon an alteration in the form and arrangement of the pigment cells.‡

These examples prove to us, that a change of colour can take place in the skin of certain animals, without either a diminution or augmentation of the pigmentary deposit taking place. And also that it may be induced by a stimulus applied either directly to the skin or indirectly through the medium of the nerves. The latter being either an involuntary or voluntary stimulus.

The special organization of some animals is remarkably exemplified in the functions of their skin. We find, for example, that some of those inhabiting northern latitudes, the ermine, the fox, and the common weasel, which during the summer months are of a brown or grey colour, at the approach of winter become perfectly white. It is said, too, that this change of colour is not the effect of a change of the hair, but merely of the pigmentary matter. The plumage of certain birds is also said to change in colour, without a corresponding change of feathers taking place. These phenomena most probably depend more upon the peculiarity of the animals' constitution than upon external agencies, although no doubt the latter are also involved.

The differences of tint observed among the various races of the human family, are equally to be attributed to constitutional peculiarities. The gipsies are a striking illustration of this fact; for notwithstanding that they have lived during many centuries in countries whose inhabitants are perfectly fair, they still retain the black hair, the dark eye, and swarthy complexion of the Moultanee race. We have yet further evidence of constitutional peculiarities, in the fact that great difference in colour exists among the inhabitants of the same locality. Among whites we occasionally meet with individuals who might be mistaken for half-castes, and among negroes those that might pass for white men.

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* Müller's Archiv, 1854.

† In No. 27 of the Royal Society's Proceedings, Mr. Lister gives another explanation of the fact, he thinks that the cells never change in form or size, but that the pigment-granules which are suspended in a colourless fluid are capable of being on the one hand attracted by a central force into a small space in the body of the cell, and, on the other hand, dispersed by a repulsive power into the minutest recesses of the ramifying rays.

‡ Trans. Acad. Wien, Band iv. 1852.

Natural physiological changes occurring at different periods of life, also react upon the cutaneous function. It has long been observed, that at puberty the skin of the sexual apparatus becomes of a darker hue, and that in pregnant females a similar change takes place in the areola around the nipple; the depth of the colour being various in different individuals. In some the change is scarcely, if at all, perceptible, while in others it is very marked. Pregnancy is also occasionally accompanied by a deposit of pigment in the cutaneous surface of different parts of the body, more particularly of the abdomen in the neighbourhood of the umbilicus. Eight years ago, while house-surgeon to the Edinburgh Royal Maternity Hospital, I met with three cases of this sort, and in 1852–53, I saw other three cases of the same affection in the lying-in wards at Paris. I remember one case in particular, where a fair-complexioned young woman had a large yellow patch on the forehead extending down the nose, and another of much greater size and darker colour on the abdomen. During one of the visits, Professor Dubois remarked that he had frequently met with similar cases, and that the discoloration sometimes disappeared altogether, or got paler after delivery.

Mr. Erasmus Wilson, in his admirable work on skin diseases, relates the following interesting case. A young girl, aged eighteen, stated to Mr. Jackson, her medical attendant,

> "That shortly after she became pregnant the areola round each nipple looked very dark, but no further perceptible change took place until she quickened, when an evident darkness of the whole breast was visible, extending upwards to the throat and downwards to the thighs, gradually assuming a deep black colour. Over the hips it extended laterally; but no part of the posterior surface of the body was affected. Her complexion was naturally rather dark, with black hair and eyes. Her health had been always good. . . . She left the house (High Wycomb Union) a month after her confinement, at which time there was no alteration in the blackness of the skin; but on my last meeting her (Mr. Jackson remarks), about a year afterwards, she assured me it had entirely disappeared."*

When discoloration of the skin accompanies pregnancy, we must look upon it as a purely physiological phenomenon, and as such leave its treatment to nature. There are, however, many cases of discoloration of the skin which cannot be regarded in this light, some being ushered in by different signs of morbid action, while others seem to arise spontaneously, without any apparent abnormal state of the system accompanying them. As an example of the former, I may mention a case that I saw last year. The lady had several yellowish-brown patches on different parts of the body, and was then under the care of Dr. Madge, to whom I am indebted for the following notes of the case:

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* Diseases of the Skin, p. 557. Fourth edition.

"The patient, a stout, healthy-looking person, about thirty years of age, first noticed a patch of a brownish-yellow colour on the right breast about six years ago. Shortly afterwards she became pregnant, and the patch rapidly increased in size. It extended to the arms, and covered the greater part of the epigastrium. After her confinement, having to use a stimulating application to the breast, in the form of an embrocation, the discoloration gradually disappeared from the part to which it was applied. At the same time it became less marked in the other parts affected. A large patch in the umbilical region, and several smaller ones higher up, however, remained unchanged. The patient has observed that the discoloration becomes darker and increased in extent during any disturbance of the general health. This was the case when Dr. Madge first saw her. The increase of the discoloration preceded an attack of a mild form of typhoid fever. The skin at that time was rough and tender (as in cases of chloasma). During the course of treatment it was necessary to apply mustard poultices to the epigastrium, and these appeared to have a decided effect in lessening the discoloration."

At present I have under my care an example of discoloration of the skin unaccompanied by any derangement of the system. The patient, a lady aged forty, never had any severe illness. She is short, but of stout make of body, dark hair and eyes, and is the mother of two children. On her arms, legs, and abdomen, are several very small dark spots, while her face, neck, and shoulders, are of a uniform dark colour, with the exception of a few small yellow patches on the face. At first sight she might be mistaken for a mulatress. She attributes the discoloration to exposure to the sun in India while a child. It is now several years since her return to England, and the discoloration remains the same. This case I look upon as one of melanopathia, occurring without any apparent disordered state of the system, and probably induced by the stimulation of the sun's rays. Another patient, aged twenty, has shown me several dark brown patches, varying from the size of a sixpence to about twice the diameter of a five-shilling piece, on his arms and legs, and strange to say, he attributes these patches to injuries that he has at different times received. There is one patch in particular on the inside of the right knee, about the size of two half-crowns, which he says appeared for the first time a few months ago, after the skin had been abraded by riding on horseback. This gentleman is of good muscular development, and very dark complexion, which is accounted for by his father being a native of Portugal.

There is another form of disordered chromatogenous function occasionally met with, which is just the reverse of melanopathia—namely, a state of partial albinism. It is rather curious, too, that both diseases sometimes affect the same individual at once. I saw an interesting case of this kind a few months ago. The patient was then under the care of Dr. Charles Coote, who kindly furnished me with the following notes:

"Sarah S., aged sixty-four, suffering from dyspepsia and general debility. General aspect very anæmic, fore-arms and backs of hands covered with extensive brown-coloured patches, diversified by other spots of a pearly or silvery whiteness. On closer examination, patches of the same character, but more faintly coloured, are observed on the forehead, round the orbits, and *strikingly* on the left side of the neck. In all these situations the peculiar white patches are also very distinct. Her own story is that she has been liable to this discoloration of the skin for the last twenty years. It began during her last confinement in the form of pearly white spots on the dorsum of the hand. These, she says, eventually became brown. The discoloration at one time covered the whole body and both thighs in large patches; but has disappeared entirely, except round the umbilicus. Subsequently it reappeared on the arms, in larger patches than at present. She says that this discoloration has frequently attracted the attention of her employers and others; but as she experienced no inconvenience from it, she paid no particular attention."

Dr. Coote treated this patient with tonics, and her general health so much improved that she ceased her attendance. He also remarked that while under treatment the brown patches faded on the right arm, but appeared to extend on the left. The urine of this woman was several times carefully examined. It was of low specific gravity, but otherwise healthy. Disease of the skin such as we have seen in this case is not necessarily accompanied by debility. Mr. Wilson gives a portrait of a gentleman aged twenty-four, a member of one of the learned professions, who has suffered from a similar combination of melanopathia and leucopathia. This gentleman is very muscular, has always enjoyed good health, and is much given to athletic exercise. His skin has gradually been growing darker during some years. When about seventeen years of age he first noticed a bleaching of the skin at the tips of the fingers and neck. These have remained while some other white patches have resumed their brown hue. In this case there appears to be (Mr. Wilson remarks) a general activity in the formation of dark pigment over the whole skin, with a total absence of pigment in some patches. It may therefore be called a case of general melanopathia and partial leucopathia. Mr. Wilson found the application of stimulants to the white spots caused them to become dark. I have observed a similar thing to occur from friction alone.

I might make mention of other forms of discolored skin—such, for example, as the melanopathia syphilitica, chloasma, or maculæ hepaticæ, and even that which arises from prolonged exposure to the heat of charcoal, "Ephelis ignealis" of French authors; but I think the cases that I have already cited are sufficient to show that partial or even general discoloration of the skin occurs under such a variety of circumstances that it can scarcely be regarded as depending upon any one particular form of disease.

On examining with the microscope a piece of bronzed skin taken from a patient whose supra-renal capsules were diseased, I found that it presented, as shown by Mr. Hutchinson and Mr. T. West, the very same appearances as the skin of the negro. The pigmentary matter was deposited in the epithelium cells of the under layer of the epidermis—the rete mucosum, as it is sometimes called. The superficial layer of the epidermis, on the other hand, was almost entirely free of pigment. After carefully examining the individual cells containing the colouring matter, with the view of ascertaining whether the pigment was diffused throughout the cell, or merely deposited in the nucleus, I was able to satisfy myself that in this piece of bronzed skin, as a general rule, the colouring matter was not limited in its distribution to the nucleus, but spread throughout the cell. The nucleus was, however, most deeply tinged.

I have also examined bronzed skin taken from a patient with healthy supra-renal capsules, and convinced myself that its microscopical structure was in every respect identical with that taken from the other patient, whose supra-renal capsules were diseased. Moreover, I can detect no difference between the skin of a sunburnt or freckled person, and that of a patient affected with Addison's disease, except in as far as the quantity of the pigment is concerned.

In terminating the present communication, I have only to add that the conclusions which I draw from the facts stated in the preceding pages are,—Firstly, That bronzed skin may exist without the supra-renal capsules being diseased. Secondly, That complete degeneration or total absence of the supra-renal capsules may occur without any bronzing of the skin. Thirdly, That bronzed skin may be associated with a variety of different morbid conditions of the system, among which a prominent one is disease of the supra-renal capsules. Fourthly, That bronzed skin may be present without any derangement of the other functions of the body being observed. The treatment of the affection must consequently be varied accordingly.

Upon the anatomical and physiological grounds previously stated, I look upon the symptoms of anæmia, languor, debility, feebleness of the heart's action, and irritability of the stomach, not as the result of the suppression of the function of the supra-renal capsules, but rather as being occasioned either by a diseased state of the solar plexus *per se*, or by an irritation of the ganglionic system of nerves caused by the close proximity and intimate connexion of diseased supra-renal capsules.

The investigation is still far from being completed, and as I am not wedded to any hypothesis, if new facts are discovered which show the subject in a different light, I shall not hesitate to mould my views accordingly.

Postscript.—Since the preceding pages were in type, some additional facts tending to strengthen the views therein advocated have been collected.

1st. "*The capsules are not vital organs.*"—Although nearly eight months have elapsed since M. Philipeaux and I removed the capsules from some animals in Monsieur Flourens' laboratory, at the Jardin des Plantes, I have still one in my possession, alive, and healthy. The absence of its spleen, and supra-renal capsules does not appear in any way to disorder its functions. The skin and hair still remain perfectly white. Dr. Brown-Séquard has lately attempted to explain the cause of our success in removing the capsules, by supposing that in albinoes the capsules have no function to perform. This argument is easily proved untenable; for I have been equally successful in my operations upon coloured animals.* Dr. Martin Magron some time since, and M. Philipeaux very recently, have published similar results.†

2nd. *When death follows extirpation of the supra-renal bodies, it is in most cases in consequence of the injury done to the neighbouring tissues; perhaps*

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* See page 218 in the last number of this Journal.

† This question has been very ably discussed by M. Vulpian in the Gazette Hebdomadaire, 6 Mars, 1858.

most frequently the mutilation of the ganglionic system of nerves.—Having procured in the latter part of February, three grey and white rats, I selected the largest and strongest for operation. On cutting down on the right supra-renal capsule, I was surprised at its unusual size. On examination after removal it was found at least four times its normal bulk, and on section and microscopic examination proved to be the seat of extensive tubercular deposit. The day after the operation the animal's respirations were very laboured, and about seventy in the minute. It gradually got worse, became very weak, and died on the sixth day with symptoms of some pulmonary affection. On examination, however, the lungs and air-passages were found perfectly healthy. *Both* sides of the heart were full of blood. All the abdominal organs were engorged. The left supra-renal capsule shared the congestion, but was otherwise healthy. The urine contained albumen. No marks of any disease were anywhere to be found except in the neighbourhood of the right semilunar ganglion. This point was the seat of tubercular deposit, in the midst of which was a mass of similar constitution about the size of a split-pea—probably a lumbar gland. The diseased mass completely covered the right semilunar ganglion. Was it the absence of the diseased capsule which killed this animal? Or was it the injury done to the already diseased ganglion? Most probably the latter. The two fellows of this rat were also operated upon. I crushed the right capsule of the one, and removed that of the other. Yet both these animals are alive and well.

3rd. *Bronzing of the skin may occur without disease of the supra-renal capsules.*—A very interesting case of this kind is very ably reported by Dr. Sloane.* The author remarks, that "the tint of the skin in the face was as dark as that of a mulatto, and over the abdomen, armpits, loins, hips, inner and upper part of thighs much darker. . . . . She (a young woman) was not of a negro or foreign descent. . . . . Left supra-renal capsule two and a quarter inches long, and one broad; weighs sixty-five grains. Right two inches in length, one in breadth, and weighs sixty grains. Both appear normal, and free from any morbid deposit." This is now the eighth well-marked case of bronzing of the skin without disease of the supra-renal bodies.

4th. *Diseased supra-renal capsules is not always associated with bronzing of the skin.*—In the 'British Medical Journal' of the 6th of February, 1858, Dr. Brittan relates two cases of supra-renal capsular disease in which no bronzing of the skin occurred. One of the cases merits special notice. The patient, a young man, aged nineteen, was fair complexioned. The right capsule "was very large and friable, and filled with tubercular-looking deposit. . . . ." The left "was like that of the right side."

In January I showed to the Pathological Society two very much hypertrophied supra-renal capsules, that were removed from a patient who died of acute pulmonary phthisis while under the care of Professor Walshe, in University College Hospital. The skin of this patient was perfectly white, and yet the enlarged organs were completely filled with tubercle. No trace of the normal medullary substance was anywhere to be found, and only here and there among the foreign material could remnants of the cortical columnar cell-masses be detected. This is now the fifteenth case of extensive disease of the supra-renal bodies unassociated with bronzing of the skin that has been reported within the last eighteen months. I have purposely omitted making any mention of those cases where only one capsule was diseased, or that otherwise appeared of a doubtful nature.

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* Medical Times and Gazette, 29th August, 1857, and Dr. Wade's Report in the Midland Quarterly Journal, 1st January, 1858.

PART FOURTH.

Chronicle of Medical Science.

HALF-YEARLY REPORT ON MICROLOGY.

By JOHN W. OGLE, M.D., F.R.C.P.

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PART I.—PHYSIOLOGICAL MICROLOGY.

NERVOUS SYSTEM AND ORGANS OF SENSE.

Minute Anatomy of the Nervous System.—M. Jacubowitsch,* a Russian observer, has lately communicated to the French Academy of Sciences the results of four years' incessant labour and microscopical investigation into this subject. He has arrived at the following conclusions:—

1. He found that all the cerebro-spinal nervous system, speaking generally, consisted of three kinds of nervous elements, *i.e.*, cells of movement, cells of sensibility, and ganglionic cells, to which should be added the axis cylinders of all the cells. He determines that the ganglionic nervous system essentially appertains to the cerebro-spinal one. He also found that cellular tissue is an important element in the formation of the nervous system, not only uniting the separate nervous elements in the form of groups forming different subdivisions, but subserving nutrition by acting as the seat of the blood-vessels. Perhaps it may aid the function of the axis cylinders by the envelope which it affords them.

2. He determined that the medulla oblongata is to be considered as simply a continuation of the spinal cord, with an extensive development of the posterior horns, and the cells of sensation and ganglionic cells, the latter being generally situated in the neighbourhood of the central canal, and the termination of the fourth ventricle.

3. That the corpora quadrigemina form a direct continuation of the spinal marrow, with which they are united by the medulla oblongata. This is the furthest part at which all the nervous elements exist together in their special relationship, whether among each other, or as regards the origin of nerves.

These bodies are distinguished by the great horse-shoe commissure, in which the first kind of ganglionic cell is only found exceptionally, and which sends numerous fibres into the optic thalami and corpora striata. Hence this commissure is an essential means of union between the spinal cord and the medulla oblongata on the one hand, and the brain and cerebellum on the other.

4. That the cerebellum is to be looked upon as formed—(*a*) By a part of the anterior column and anterior horns of the spinal cord, which penetrate for the most part into the peduncle of the spinal cord towards the cerebellum, with their cells of motion and branches of nervous fibres. (*b*) By a part of the posterior nervous columns and their elements (cells of sensation), which

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* Comptes Rendus, p. 290. Aug. 1857.

exist in the restiform bodies. (*c*) By ganglionic cells which, grouped in masses along with the above-named elements, form the mass of the medullary or white substance. This is placed in relation to the pons Varolii and corpora quadrigemina by the peduncles of the spinal cord towards the cerebellum, and the peduncles of the corpora quadrigemina. (*d*) By a grey substance forming the enveloping layer of the cerebellum, and remarkable for its pear-like cells.

5. That the hemispheres consist essentially of cells of sensation, with a peripheric layer formed, as in the cerebellum, by ramifications of axis cylinders terminating in a system of rods.

6. That the 'substance' of Rolando consists of axis cylinders, with or without medullary substance, existing not only in the posterior horns of the spinal cord but also in the brain, cerebellum, and corpora quadrigemina, with their fibrous network and their apparent layer of granules, which, in reality, are rings with simple or double contours, sections of nervous fibres.

7. That the corpuscles of the connective tissue cannot absolutely be determined. The cellular network appears almost everywhere in the form of very fine grains, and in certain places appears as a distinct network. Near the central canal, as also about the level of the aquæduct of Sylvius, and especially where the vessels are crowded, it assumes a filamentous form. Where the axis cylinders are bound together, it is changed into a homogeneous transparent membrane, with fine, almost immeasurably small granules.

8. That all the nervous elements unite with each other in three different ways. (*a*) By commissures, which place two groups, situated symmetrically, in relation, by means of axis cylinders. (*b*) By unions between the nervous cells of the same kind, near to or distant from each other on the same side. (*c*) By the layer at the periphery of the brain and cerebellum (the *couche en baguettes*), in which we find the three kinds of cells with their ramifications.

9. That the absolute and relative size of the three nervous elements forms the true criterion of the importance of the whole or parts of the nervous system. In man they are absolutely and relatively the smallest, and therefore in him they are most numerous. As these cells seem to multiply like other histological elements, it is probable that a numerical increase of nervous elements takes place at the same time as the diminution of part of the connective tissue during intellectual development, and this without the entire mass becoming larger. In like manner it has been shown that in dementia and different forms of cretinism the development of nervous elements remains stationary, or even that a substitution of connective tissue for nervous cells takes place. The various shades of colour seen in various parts of healthy brains seems only to depend upon the number, thickness, and other peculiarities of blood-vessels.

10. That all cerebro-spinal nerves are of a mixed character. The anterior and motor roots consist of filaments which pass from cells of motion and sensation, and ganglionic cells; and the number of these elements varies in the different regions of the spinal cord. The posterior roots, consisting chiefly of filaments from the ganglionic cells and those of sensation, contain some, also, from motor cells, whilst the nerves from the medulla oblongata consist throughout of filaments from the ganglionic and sensory cells only; a few only, namely, those taking origin from the course of the spinal cord within the medulla oblongata, having filaments from the cells of motion. All the cerebral nerves, excepting those of the three special senses, which consist only of filaments from the ganglionic cells and those of sensation, are formed by filaments from all the three varieties of cells. The varying thickness of the spinal cord, and the increased size of the medulla oblongata, depend upon the number and disposition of the nervous elements.

11. That in poisoning animals by conein, nicotine, prussic acid, &c., the nervous and cellular elements become destroyed, the membranes torn, the axis

cylinders separated from the cells and otherwise injured, and the contents of the cells hardened and dwindled, apparently from sudden interruption of their nutrition. This fact renders it impossible to trust preparations made from animals so killed.

OSSEOUS AND CARTILAGINOUS SYSTEM.

Articulation between the Cartilage and the Bone of the First Rib.—Professor Luschka* has observed this on both sides of the body of a man aged fifty-five, of strong muscular conformation. On both sides the cartilage of the first rib had undergone complete ossification, and between the cartilage and bone only a slight movement existed, but still there were the true characteristics of an articulation—a cavity, cartilaginous investment of the opposed bony parts, and a fibrous enveloping material. The cartilaginous plates of the articular cavity had no smooth surface, but were uneven and occupied by fibrous villous projections, and consisted of a fibrous basis with cartilage cells intermixed. There was no trace of any synovial membrane or vessel holding cells. Luschka looked upon the formation as a joint arrested in development.

MUSCULAR SYSTEM.

Histology of Muscular Fibre.—Dr. H. Welcker† considers that Leydig's view, according to which the small puncta or ringlets seen on transverse section of the primitive muscular bundles, are not sections of solid fibre, but of hollow spaces with sacculated margins, is owing to a confusion between fibrils and the so-called muscular hollow spaces. Having dried the muscles of a frog, and made transverse sections, which he moistened, he saw inside the contours of the pouches of the sarcolemma innumerable fine puncta, belonging to a deeply extending structure. The superficial end did not appear to be a ringlet, but a dark spot, which, on adjusting the focus, became glistening. Consequently the author looks upon the fibrils as being solid. But between the puncta, he noticed fissure-shaped cavities, which had a reddish yellow look on focussing and by direct light, and had a silvery appearance. These are to be considered as muscular hollow spaces, or possessing walls, as muscular corpuscles; and, according to the strength of the bundles, from four to twenty-four, could be counted inside a sectional plain. There are also elongated air-containing spaces, which in the case of fresh muscle, treated by acetic acid, appear as the well-known nuclei. The fibrils and muscular hollow spaces or corpuscles have been confounded by Leydig, according to Welcker, although they differ in size, form, and number. He considers, moreover, that these hollow spaces form a contrivance for the saturation of the primitive bundles, inasmuch as the capillaries only encircle these bundles. He could, however, not find any processes establishing a communication between these spaces, and therefore imagines them to be formed of cells, which, being analogous to cartilage corpuscles, he calls muscular corpuscles. They are somewhat smaller than the bone corpuscles. The author goes on to speak of the connexion between these corpuscles by fine processes, the whole forming an abundant system of fluid-conducting spaces.

Muscular Fibres of the Tongue in the Frog.—Speaking of these fibres, Billroth‡ states that the divisions of the primitive fibres diminish gradually in size, but yet often retain their transverse striæ, until close beneath the papillæ. Here, if not sooner, they are reduced to very fine dark fibres, which pass into the processes of cells, with large nuclei, and contain lateral anastomosing branches. These branches in part proceed as fibrils into the papillæ, and are thus in connexion with the epithelial cells, which are found to possess cilia, and also short as well as long processes, by which they are in immediate connexion with the fibrils of the papillæ.

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* Schmidt's Jahrbücher, No. 11, p. 154. 1857.

† Henle und Pfeuffer's Zeitschrift, b. F. viii. p. 226: as quoted in Schmidt's Jahrbücher No. 10, Band 96, p. 5.

‡ Deutsche Klinik, 21; 1857: quoted from Schmidt's Jahrbücher.

FIBROUS TISSUES.

Elastic Fibres.—Welcker, of Giessen,* after making observations upon the solidity of embryonal and the completely developed elastic fibres, determines that the complete form is not hollow. Even the finest elastic fibres, which are everywhere distributed in areolar tissue, and exist in the cutis and serous membrane, &c., are not hollow, inasmuch as elastic fibres filled with serum would exhibit an inner parietal contour if placed in water, which is not to be seen in them. The invisibility of the inner parietal contour could only be explained by supposing extreme thinness of the wall. But the excessive lustre of the elastic fibres exhibited on focussing, rather militates against the supposition of its hollowness, because if it was truly hollow, this glistering could only take place when it was filled with fluid which, like Canada balsam, had highly refracting powers, and such as is not known to exist in the animal body. The formative cells of elastic tissue show in water, on the contrary, no excessive lustre, and their contents are not more refractive than water itself. Consequently, Welcker concludes that elastic fibre is not hollow in an early stage of development, when the cell corpuscles are still in existence.

GENITO-URINARY SYSTEM.

Minute Anatomy of the Kidney.—Dr. C. E. Isaacs, in a very long and well illustrated article,† after passing in review with criticism the opinions of most of those who have written on the anatomy and physiology of the kidneys, such as Malpighi, Bellini, Bowman, Johnson, Gerlach, and others, gives the results of his own observations. He applies himself to the elucidation of the following points:—The nature of the tubular epithelium; the connexion between the Malpighian bodies and the uriniferous tubes; the existence of ciliated epithelium in the tubes of the higher animals, and of nucleated cells on the Malpighian tufts; the presence of a fibrous matrix, and the arrangement of the venous plexus.

The author considers that the discrepancies which exist in the statements of so many writers on this subject, arise from their employing different and insufficient methods of observation; and states, that besides injections, to which many have confined themselves, his own observations were conducted upon preparations rendered transparent by certain processes, which also permitted their being examined as opaque objects.

Speaking of the tubes and their epithelium, he describes the latter as of the tesselated kind, according with Hassal, and differing from Bowman and Johnson, who describe it as spheroidal. He believes that when the epithelium possesses the form last mentioned, it is owing to the kidney not being fresh or being diseased, or that the epithelium has been altered by some mode of examination. As regards the presence of ciliated epithelium in the tubes, which is well known to exist in many animals, the author concludes that ciliary motion exists in the uriniferous tubes of animals of a high grade, but in an imperfect and rudimentary condition. Yet although he had seen movements connected with the lining cells, he had only once seen a single cell apparently fringed with cilia, and that was in the ox.

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* Henle und Pfeuffer's Zeitschrift, viii. p. 225: quoted in Schmidt's Jahrbücher, No. 10, p. 5. 1857.

† Transactions of New York Academy of Medicine, vol. i. pt. ix. p. 377

Concerning the Malpighian bodies and the uriniferous tubes, he says they can only be seen to perfection in transparent preparations, and best of all in thin sections boiled for two or three minutes in water and sulphuric acid (three drops to the half ounce). In order to show the vessels in connexion with the Malpighian bodies, and at the same time the tubes, he injects the vessels with white lead, finely ground in oil, and well shaken with sulphuric ether; and subsequently he boils small portions thus injected in very dilute chloroform. The preparations are then examined in a moist state, or immersed in turpentine.

For the purpose of watching the relations between the tubes and the Malpighian bodies, he simply examined fine scrapings of the kidney after agitating them with water, or boiling them in dilute sulphuric acid, or after heating them in dilute chloroform, but not to boiling point. He determines that the Malpighian tuft or coil of capillaries is enclosed by the expanded extremity or capsule of the convoluted uriniferous tube, agreeable to the conclusions of Bowman and Busch, and in opposition to those of Müller, Toynbee, Gerlach, Bidder, Huschke, and Hyrtl. He never has observed blind terminations or anastomoses of the tubes, except in the frog, fish, and turtle, although he does not deny their existence.

As to the vexed question, whether nucleated cells exist upon the Malpighian tufts, the author does not easily decide, owing to the layer of cells lining the inner surface of the capsule surrounding the tuft. In order to obviate the difficulty, he injected solutions into the ureter, as eventually to distend and rupture the capsular termination of the uriniferous tubes, the Malpighian coil having been previously only slightly injected, and thus it was clearly seen that epithelial cells existed on the uninjected and transparent edges of the tuft. He also obtained his object by scraping off the capsules by fine needles, and washing the scrapings for two or three days in water, by which the epithelium was washed from the capsules and they were distended by water which had soaked through the capsule. All these methods gave the same results, viz., that the Malpighian coil is covered by epithelium, and is not, as Bowman describes it, bare and naked within its capsule. Dr. Isaacs then takes exception to the supposition entertained by most physiologists, as to the functions of the Malpighian body being exclusively confined to the elimination of watery parts of the blood, and states his belief that many of the component parts of the urine pass through the Malpighian tuft in combination with water, their separation not being limited to the cells of the tubes. For this view he gives his reasons. He also entirely dissents from the explanation given by Mr. Bowman, of the physiology of the human kidney, by consideration of structure in the kidney of the boa-constrictor; and shows the want of resemblance between the vascular arrangement of the kidney of the boa and the higher animals, and also the absence of any foundation for the supposed analogy between the efferent vessels in the human kidney and the portal vein.

The author quite confirms the statements of Johnson, Gairdner, and Beale as to the existence of a true fibrous matrix in the kidney, in opposition to those of Rokitansky and Frerichs, who consider such fibrous tissue to be a product of disease. On the addition of acetic acid this tissue, when torn up, is seen to contain elongated bodies, or nuclei. No yellow elastic tissue was seen in it, as described by Hassal. The author alludes to the influence of induration of this matrix upon the small vessels passing through it, interfering with nutrition. Dr. Isaacs has also communicated a paper, with a later date, upon the Function of the Malpighian Bodies.

PART II.—PATHOLOGICAL MICROLOGY.

TUMOURS, MORBID GROWTHS, EXCRESCENCES, &c.

Case of Cylindroma. By Dr. Volkmann, of Halle.*—The author details at length a case of this kind of growth, so named by Billroth and by H. Meckel, pouched cartilage tumour. The patient was a woman, aged fifty-nine, the whole almost of whose face on the left side was in a state of deeply extending ulceration, unattended by any affection of the lymphatic glands of head or neck, and who died with abscesses in the lung. The ulcer had much the appearance of an ulcerated cancroid growth. Those parts of new growth which were not destroyed by ulceration could, by manipulation, be separated into elevated gland-like or wart-like projections. On a sectional surface this kind of structure was but seldom seen, and in such places, out of a very scanty areolar network, transparent bodies could be removed, the whole being very like an instance of cystoid enchondroma of the metacarpus, with secondary enchondroma of the lung, described by the author in the 'Deutsche Klinik,' 1855, No. 51. On microscopical examination a very large number of small, sharply contoured, and dark round or oval, granulated cells were seen to cover the field, and in the harder parts of the growth these cells were in every stage passing into elongated spindle-shaped cells. In other places the cells were shrinking and degenerating. Moreover, a peculiar gland-like structure was seen, and in the substratum clear globular spaces or vesicles existed, which, for the most part, were situated close together, resembling closed and variously-sized gland follicles. In other places glandular and branched formations, with club-shaped extremities were seen in a stroma consisting of cells. On tearing up portions, very large, clear, sharply-defined globules were seen, varying in size, which collapsed on pressure, allowing a water-like contents to flow out; other globules also existed containing secondary ones. The secondary cells contained a single round nucleus, often bearing the homogeneous appearance of blood-red corpuscles—seldom from four to eight nuclei; and the nucleus was often surrounded by molecular matter. In parts resembling the glandular pouches, most beautiful cactus-like club and pointed-shaped forms were seen, often clear and structureless, filled by fluid, and increasing by the outgrowth of small secondary club-shaped projections. As development progressed, the formation of cells and areolar tissue was seen within the homogeneous contents of the pouches. In some cases spindle or star-shaped pale nucleated cells existed in the axis of the pouch; and in others a delicate skein of areolar tissue was seen in the middle of the club-like processes, the lateral parts of which were still quite homogeneous and transparent. In some cases small round granulated cells were seen in the axis of these processes, quite identical with those forming the stroma. The bloodvessels of this growth were scanty, and never was seen (as Billroth describes) the formation of vessels within the hyaline processes. After describing the growth, the author goes on to consider the method and origin of the various forms. He thinks it impossible to say whether the new formation arose from areolar tissue or epidermal structures. He concludes that the pouches or fluid sacs originate from the budding of the spherical bodies or vesicles, which spring at first from an enlargement of pre-existing connective tissue cells, and of which some proceed to the development of the pouches, whilst others remain sterile. Within some of these pouches extreme endogenous growth of cell-structure takes place, which fills the pouch and remains as cells, or proceed to form areolar tissue fibres.

The author concludes by allusion to the views of Virchow on the formation of the vesicular bodies found by him in his case of ecchondrosis prolifera at the base of the skull, as alluded to by Zenker just below. Volkmann, contrary to Virchow, thinks the vesicles are to be looked on as extremely dilated cells.

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* Virchow's Archiv, Band xii. Heft 2 and 3, pp. 293. 1857. (With plates.)

Calcareous Deposit in the Periosteum of the Inner Ear.—Dr. A. Böttcher,[*] of Dorpat, found depositions of this nature in the inner ear of adult persons of every age, but increasing in amount and size with age. He did not find any trace in the infant. He found them chiefly in the periosteum of the internal auditory meatus, but also in other parts, and sometimes, though scantily, in the neurilemma of the acoustic nerve. The concretions were in form round, oval, elongated, lemon and club-shaped, with definite contours in part, in part not so. They refract the light strongly, and are both homogeneous and concentrically formed, and in places were surrounded by organic material arranged concentrically. They were formed of phosphate of lime, and could not be confounded with the otolithes, which were of carbonate of lime and crystallized, and found in the vestibule (Vorhof), having no organic substructure. It is interesting to notice that in many lower vertebratæ, and some invertebratæ, otolithes are found, having great similarity to these concretions, as described by Leydig in his 'Histology of Man and Animals. These deposits seem not to produce any injurious or inconvenient effects.

Gelatinous Tumour (the Enchondrosis Prolifera of Virchow) of the Clivus Blumenbachii.[†]—Professor Zenker,[‡] of Dresden, after alluding to the observations of Virchow and Luschka, whose case was quoted at p. 517 of the fortieth number of this Journal, alludes to three cases which have come under his own knowledge. Two of them died of disease of the lungs. The growths showed, on microscopical examination, a very scanty fine fibrous basis, and multitudes of closely-pressed, large, irregular, roundish cells, containing large oval nuclei and nucleoli attached to their walls, whilst the rest of the cells, for the most part, were occupied by a round vesicle with homogeneous contents. Here and there, small spherical cells, with finely granular contents, were seen between these larger cells. The continued application of diluted spirit destroyed the cellular elements, leaving only the fibrous. The first tumour contained, also, along its whole length, a tolerable amount of finely fibrillated areolar tissue, consisting of spiral fibres, which might in one case have been derived from the basilar arachnoid, with which it was connected. In reference to the interesting fact of the connexion between this kind of tumour and the part of the skull affected, the author alludes to the observation of Luschka upon the changes in the interstitial cartilage,[§] to which in a former report we alluded; and suggests an analogy between such growths and the anomalies of development of the spheno-occipital synchondrosis.

THE BLOOD.

Leukhæmia.—Peculiar co-existing state of the Mucous Membrane of the Digestive Organs.—Dr. N. Friedreich,[||] of Würzburg, relates at very great length the details of a case. The patient was a woman, aged forty-six, who died eventually, having fallen suddenly into a syncopal condition. The outer lymphatic glands were hardly at all enlarged, but the glands about the mesentery and stomach were very much so, showing on section homogeneous soft white masses, very like some portions of the thickened spongy pleura formed from fresh and old pseudo-membranous deposits, and found within the thorax. The most interesting observation after death was the unusual state of the mucous membrane of the stomach and intestines.

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[*] Virchow's Archiv, Band xii. Heft 1, p. 104. 1857.

[†] Ibid. p. 108.

[‡] Ueber die Entwickelung des Schadelgrundes. 1857.

[§] Archiv, ix. 8, 216.

[||] Virchow's Archiv, Band xii. Heft 1, p. 37. 1857.

From the cæcal valve upwards as high as the duodenum, numerous large and small flat and prominent elevations existed, having the closest resemblance to the pulpy typhus infiltration previous to ulceration. These were very plentiful in the lower part of the ileum, where the mesenteric glands were largest, and were obviously occupying the place of the Peyer's glands, but were not entirely confined to them. They showed, on section, the same appearances as the mesenteric glands. The large intestine was free from these tumours, excepting the rectum, which contained one or two. In connexion with one of these leukhæmic enlargements, in one place a varicose lymphatic vessel, of the size of a small quill, and filled with white juice, was seen passing into an enlarged lymphatic gland, but no outgoing vessel from the gland could be distinguished. In the stomach, near the cardiac end, and on the posterior wall, a flat, irregularly bounded elevation, covered by mucous membrane, existed, and several such were seen in the pyloric half of the stomach. These were evidently of the same nature as those in the intestine. The spleen was enlarged, the pulp being very soft, and the Malpighian bodies very large, the trabecular work being very indistinct. The reaction of the spleen, pulp, and of the splenic venous blood was intensely acid. The liver was enlarged, showing in one part a cavernous blood-tumour; and in another part, almost occupying the entire thickness of the viscus, was a soft, roundish tumour of a greyish-white colour and pulpy consistence.

On microscopical examination, the author concluded that the intestinal tumours had the same histological elements as the enlarged glands; namely, large and oval nuclei, as also round cells, chiefly with single nuclei. The tumours appeared to have no original relationship to the pre-existing follicles of the mucous membrane, but to be developed in the mucous and submucous tissues. On examining parts of the deepest portions of the tumours, where connected with the deep layer of the submucous tissue, the numerous and enlarged areolar tissue-cells were seen to contain two and more endogenous nuclei and cells undergoing fatty degeneration; and every transitional form up to large and oval spaces filled with various endogenous formations, presented themselves. The follicles of the mucous membrane were seen to be atrophied and filled with fatty detritus.

The author traces the origin of the colourless elements to the areolar tissue corpuscles of the intestinal mucous membrane, and in the same way he traces the growth before spoken of on the pleura, and which consisted of numerous colourless elements, partly nuclei and partly cells, to the pre-existing areolar tissue corpuscles of the pleura. He declares that in the most beautiful manner it can be seen how by endogenous formation within them, at first two and three, and later on more, nuclei arise, which grow to such an extent that the special areolar tissue of the pleura can hardly be seen. This endogenous cell-growth appears to occur without any special preceding afflux of blood. The spleen showed white follicles, consisting of small, colourless cells, containing fat-drops, as also many free nuclei, some fine fatty detritus, and remains of cells. Here and there large cells, with many endogenous nuclei, were seen. The pulp contained numbers of spindle-shaped spleen corpuscles, and many large and small colourless cells, some being in a state of fatty degeneration, others containing many nuclei, also a great number of large blood-corpuscle-holding cells. The hepatic cells were double or three times their natural size, and most of them were very irregular in size, containing two or three large, sharply-contoured, round and oval nucleoli. The liver substance, like the spleen, gave an acid reaction. The greyish-white tumour within this viscus consisted of small, round, nucleated cells, and also free nucleus-like bodies in a soft connective tissue stroma, containing spindle-shaped cells. The author supposes the colourless elements to have arisen from the areolar tissue-cells of the hepatic stroma when undergoing contemporary growth. He also found in the middle of the tumour a circular space, in which large, clearly-contoured cells filled with many endogenous glittering nuclei existed. This is supposed by the author to be analogous to the newly-formed follicle found by Virchow (see his 'Gesammelte Abhandlungen,' s. 207) in the liver of a leukhæmic patient, and considered by him as a degenerated areolar tissue corpuscle, enlarged by endogenous growth. The blood was also generally very acid, especially in the splenic vein blood, where were found the largest number of white corpuscles. The above case tends to confirm the observations of Virchow upon the existence of leukhæmic tumours of the liver and kidneys, and upon the supposed part which connective tissue corpuscles play in the production of colourless forms in leukhæmia; and also those of Schreiber (Dissert. Inauguralis) as to the changes in the intestinal mucous membrane. The author also quotes a case of leukhæmia related by Robin and Isambert (Gaz. Medic. 1856, p. 682), in which Peyer's patches were pale and enlarged; and alludes to the observations of Virchow and Leydig, who suppose a most intimate connexion to exist between connective tissue corpuscles and the commencement of lymphatic vessels. He concludes by drawing an analogy between leukhæmia and abdominal typhus, both in respect of certain anatomical characters, increase of colourless corpuscles, &c., as also in the tendency to hæmorrhage, the formation of ulcers of the mouth and skin, the diarrhœa, &c. He mentions the interesting fact that the pulpy tumour mass, on exposure to the air, assumed a reddish colour, as did the leukhæmic pleural patch, and this accords with the observations of Virchow, Valentin, Gubles, and Quevenne, as to the spontaneous change of colour which lymph corpuscles undergo under the action of the air.

GENITO-URINARY SYSTEM.

Sarcinæ in the Urine of Man.—A peculiar instance of this has been recorded by Dr. Warburton Begbie.* The author, after alluding to the discovery of these bodies (now fully recognised as vegetable in nature) in matters vomited during life from the stomach, in the fæces, in certain abscesses, in the lungs, and in the urine, as mentioned by various authors, details a case in which the peculiarity consisted in the sarcinæ being persistent in the urine. The case was that of a gentleman, aged sixty, who for some time had been complaining of numerous dyspeptic symptoms, along with lumbar pain and frequent desire to empty the bladder. At one time he had suffered from retention of the urine. When examined, the urine was found to be pale, with a sediment of mucus, to be neutral, and having a specific gravity of 1·025; not coagulable by heat, but depositing phosphates. "Under the microscope, numerous sarcinæ, smaller in size, but otherwise precisely similar to the sarcinæ ventriculi, were at once detected." These were found as well immediately on the passage of the urine, as when it had been kept for a day or two. The patient was treated by mineral acids, with alkaline aperients, by which his general symptoms were relieved. The urine was examined at intervals for above two months (in all about ten times), and the sarcinæ were always found in it. It was worthy of observation that no torulæ were found in it, and that it speedily became neutral and alkaline, during which time the sarcinæ were still visible; but after some time, as the urine decomposed, the cells became broken up, and at last destroyed.

Vegetable Nucleus of Calculus in the Human Bladder.—The Reporter has lately had the opportunity of examining portions of a calculus (of the triple phosphate variety) removed from the bladder of a gentleman during life, which had as a nucleus a number of brittle foliaceous-looking masses of about one-eighth to one-fourth of an inch in size. On microscopical examination, after the addition of a little acid, they were quite obviously seen to be vegetable in character, presenting numbers of vegetable cells in a good state of preservation. The case occurred in the practice of Mr. Charles Hawkins, and will be probably given at some length to the profession hereafter. It is supposed, from the patient's symptoms, that a fistulous communication had existed between the bladder and some part of the intestinal tract, through which fæcal matter had passed into the bladder.

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* Edinburgh Medical Journal, p. 902. 1857.

MISCELLANEOUS.

Vegetable Parasitic Structures. — *Pneumonomycosis* (*aspergillus pulmonum Hominis*).—An instance of this is related by Professor von Dusch and Dr. A. Pagenstecker,* and is given at length, with illustrations. It occurred in the case of a woman, aged sixty-nine, who died of phthisis. In the right lung was found a fluctuating inflammatory deposit, consisting of a brown, inodorous ichor, unconnected with any bronchial tube. In the upper part was found a small spot, of a greyish-green colour, and of a dryish velvety character, and presenting, under the microscope, that form of fungus described by Welcker as having been found by Hasse in an inflammatory deposit within the lung.† The mycelium could be recognised, even by the naked eye, as a fine, dingy green pellicle, and was in places flocculent, containing elastic fibres of the destroyed lung tissue. The threads were void of colour, being 0·002—6 millimetres broad, numerously branched, and often knotted and tufted. Articulations were not often seen, but true septa were here and there visible when the double contour of the threads was more evident. The fruit stalks were of various lengths, in some cases being very long, their breadth increasing towards the extremities. They were not truly articulated, but possessed septa. Occasionally two heads were seen to one stalk, not only as Welcker described, with short necks, but also on longer branches. The youngest heads were seen as simple swellings at the end of the broad stalks. At times granular pale contents were seen, but this appearance might have been the first formation of the basidia. Very often club-shaped swellings of the broad pedicles existed, which were probably fruit-stalks which had not produced any ripe receptacle, and forms existed of fine articulated threads in various stages of transition to the very broad, clavate swellings. The limits of the receptacles were seen by the basidia, and the bendings seen on the stalks often existed also on the necks. The appearance of the limitary wall between the receptacle and the stalk was not real, but the result of folding. The basidia had a length of 0·003 — 36 millimetres, and a breadth of 0·001 millimetres. When young they were very pale, afterwards they assumed a greenish-brown colour, and were so placed as to leave the under parts of the head free. Those at the summit of the receptacle were perpendicular to its surface, whilst those at the side inclined so as to deviate slightly from a truly radial direction. The base of such basidium was hexagonal in shape. The sporidia were clearer and more obviously green than the brownish basidia, and extended chiefly in a simple layer over the basidian layer of the ripe heads, or a portion of them. Occasionally a small aggregate of sharply-contoured, fine molecules, like desiccated sporidia, was seen; in other places, heaps of sporidia without receptacles were seen lying quite free, but still retaining the original spherical arrangements. Those which had fallen, at first scarcely 0·0012 millimetres in diameter, grew to 0·003 millimetres, and threw out a thread from one of their extremities which almost

* Virchow's Archiv, Band xi. Heft 6, p. 561.

† Vide Küchenmeister's Parasiten, II. 3, 144.

reached their own thickness, and still grew and branched out into other similar sprouts, forming the mycelium—a firm basis which gradually elevated itself above the level of the ichor, forming a bed for the development and fructification of the plant. In addition to the above-named deposit in the lung, a recent coagulum of blood was found in one of the branches of the second range of the pulmonary artery, passing into the finer branches. It was tolerably soft, and of a dark-red colour, and moderately adherent to the arterial walls. The author proceeds to show that the present case only differs as regards the existence of the fungus of the lung from those related by Virchow and Hasse, &c., in that it was combined with pulmonary phthisis. He notices, as being important, the fact that the fungus was only found at the dry portions of the decomposed lung tissue, and also the freedom from any odour. He imagines that perhaps the necrotic lung-tissue may be the most favourable seat for the "aspergillus" to thrive in, being probably inhaled with the breath, and that the want of the sporules in the air accounts for its not generally growing in such lung diseases. A special atmosphere, with a suitable high temperature of the lung, may, according to the author, possibly be requisite for its development.

Human Entozoa. By R. Virchow.*—The author, after speaking of the comparative frequency and extension of the various kinds of human entozoa, specially as regards the towns of Wurzburgh and Berlin, the reasons for which he does not venture to give, although he appears to adopt the opinion that the variety of food used has something to do with the fact, proceeds to speak specially of the calcareous bodies contained as well in the tænia as the cysticercus and echinococcus. These calcareous bodies have been figured by Siebold according to the species,† and treated of by Küchenmeister. Virchow alludes to the opinion of Secger, who in 1852 spoke of them as glands possessing ducts, and to that of most observers, who have looked upon them merely as a species of concretion. The corpuscles in the entozoa have generally an appearance so evenly round and dense that they look like solid calcareous granules; yet they possess a scaly texture, having on their surface two or more concentric marks, and after solution of the salt by reagents showing an organic material with a small central cavity, or a kind of fine nucleus. This is often difficult to see, and even by polarized light one often sees nothing but laminated concentric streaks. Never was the cross-marking seen which is visible in vegetable starch bodies, and the granular bodies of the brain by polarization. The author speaks of the development of these bodies as witnessed in echinococci of various sizes. He says that it is evident that the calcareous matter is not simply deposited after the manner of a concretion, but rather after that of an incrustation. These structures are small pale corpuscles, chiefly oval in form, showing almost always an outer, often double, covering, with contents at one time homogeneous, at another striped radially. Often a central, round, or irregular nucleus is seen, from which the streaking passes, and cracks are produced by pressure. They gradually become encrusted by calcareous matter, forming the calcareous bodies, becoming broader, and assuming a concentric and striped character, pores appearing where the radii reach the surface. The deposit of lime-salts is most obvious in the interior, from whence it advances layer by layer to the periphery. In some cases the centre is completely occupied by the deposit, which advances, rendering the whole quite solid; in others a large or small round, or oval, or angular cavity is left in the centre, containing from one to two fine nucleus-like bodies. The cavity may be closed, or communicate externally by projections, which may proceed to the surface as pores, or be of large size, as in bone-corpuscles; and if the cavity be large, very often a lining membrane is seen. Sometimes the bodies present marks of division. The author observes that all this calls to mind cell-processes, and chiefly the history of cartilage and bone-corpuscles in the higher mammalia. Should this comparison be suitable we should have a kind of areolar tissue, and the whole might be compared to the formation of the skeleton. In fact this, according to the author, appears to be the case, who thinks that it is the cellular element of the areolar tissue from which proceed the calcareous salts. This appears to be so from the observation of young echinococci, the youngest, those without hooklets, having nothing inside them to be seen, but are formed out of a turbid, soft granular material. Often, before they have hooklets, we may observe in the yet obscure basis small round or oval accumulations. Sometimes a small central nucleus is visible. Soon these elements become larger, their contents clearer or more homogeneous, the covering thicker, and gradually laminated; and thus one element after another becomes changed into a cartilage-like structure, which finally calcifies. In some cases pigment is formed within, and up to a certain point the calcareous corpuscles increase in proportion to the size of the animalcule.

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* Helminthologische Notizen: Virchow's Archiv, Band xi. Heft i. p. 79.

† Lehrbuch der vergl. Anatomie der wirbell. Thieren.

On the Aphthous Condition of the Mucous Membrane of the Mouth in connexion with Growth of Fungi. By Dr. A. Vogel, of Munich.*—This disease, the stomatitis pseudo-membranacea, or aphthophyta, is described by the author, as far as the microscope is concerned, and as regards the white patches of the mouth, as presenting, firstly, masses of granular material; secondly, pavement epithelium; and thirdly, a fungus in various stages of development (the oidium albicans of Robin). The various stages of progress are minutely described by the author. We have, in the first place, the natural colour of the interior of the mouth changed to a diffused dark red, the edges of the gums being less coloured. This is the case especially with the tongue, whose papillæ are very prominent. The temperature becomes raised, and the lining of the mouth becomes tender to the touch, rendering sucking and swallowing painful. The secretion of the mouth is noticed as losing its lubricity, becoming sticky, and assuming an acid reaction. The author proceeds to dilate upon the natural peculiarities of the fluids of the mouth in connexion with the chemical alterations, alluding to the special distinction to be made between the properties of the salivary and the mucous secretions. If a portion of the sticky, reddened mucous membrane be examined by the microscope, there is seen, along with epithelium, a number of ovate sharply-contoured bodies, cemented together. These are to be recognised as spores of a fungus, the growth of the latter being obviously prepared by the irritation of the mucous membrane by chemically altered glandular secretions. The white spots in the mouth then appear to coalesce, and often cover the whole mucous membrane with white scurf, which becomes yellow and brown by exposure to the air and admixture of blood, and may eventually be removed with ease without pain or loss of blood. The spores, thallus-threads, and epithelium are seen under the microscope to be all surrounded by a finely-granular mass. The free surface of the aphthous membrane contains a large number of spores, less thallus-threads, and much epithelium; whilst on the surface next to the mucous membrane there is no epithelium, but a thick tissue of thallus-threads, and but few spores. On placing a portion in concentrated potash solution for twenty-four hours, the epithelium first disappears, and the white granular mass becomes more transparent and homogeneous, but the thallus-threads undergo no change. In places, a yellow colour is seen to be given to the granular mass, owing to slight admixture of blood.

As regards the fungus, there appears to be two kinds. The *first*, a broader form, with many transverse marks of the form of yeast-threads; and a *second*, narrower, and free from transverse marks, less sharply contoured, and chiefly granulated. This form appears always to be found, whereas the first one is not. It was curious to find that a portion of an apple containing moisture, and under a tolerably high temperature, if kept under a glass case for from four to five days, showed no fungus-growth upon it, whilst a similar piece, under like circumstances, became covered by fungus, if a portion of the aphthous membrane was placed upon it. The author alludes to the views of Gubler and others,[*] that the first white points correspond to mucous glands, and that the fungus grows out of them. He does not seem to think it proven that the glands are the *habitat* of the fungus sooner than the other parts of the mucous membrane. He himself theorizes as follows. He supposes that the first thallus-threads grow between the upper epithelial layers, penetrate over all as the roots of a tree, and finally enclose the entire epithelial layer in a thick felty texture. Having come in contact with the mucous membrane itself, it irritates it to more secretion, or increases the irritation set up by the acid secretion of the oral cavity, and thus a thick layer of granular exudation is formed, which is occupied by the thallus-threads. Fatty matter also can be extracted by ether from the aphthous product, often in considerable quantities, as is seen under the microscope. According to Reubold,[†] the fungus only affects the pavement form of epithelium, and not the cylindrical or the ciliated form; so that no independent observer mentions it as extending to the stomach and intestine. The disease is often complicated with a dangerous catarrh of the bowels; children have cholera-like symptoms, collapse, sinking of the fontanelles and eye-balls, &c. The author, in determining a rational method of treatment, found, by aid of the microscope, that new projections from the fungus-threads, after some days, are formed, if a portion of the aphthous membrane be placed in pure water, or in any solution of a salt not having alkaline reaction—as the chlorate of potash, &c. This also was especially the case if sugar and water was used. But in dilute alkaline solutions, as borax, phosphate of soda—as also in solutions of metallic salts—no new fungus formations take place. On the addition of strong alkalies, the fungus almost disappears. Thus in treatment the end to be aimed at would appear to be the neutralization of the fluid of the mouth, and hence the use of borax solution; but he objects strongly to the ordinary mixture of honey or syrup with the borax. Hence, also, the use of fresh milk, from its tendency to change into casein and sugar, is not good as food.

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* Henle und Pfeufer's Zeitschrift für rationelle Medicin, Band viii. Heft ii. p. 317.

Aphthous Fungus as found on the Female Nipple. By Küchenmeister.[‡]—The author, whose authority regarding parasitical formations is so well known, entering upon the question whether the oidium albicans takes possession of the nipple of the nurse, shows that the sore nipple may be the seat of this fungus. He gives a case in which the aphthæ were found on the cracked nipples of a person who had been suckling an aphthous child. He quotes at length the microscopical description of a fungus found by Hoffmann and Leuckart, which had a double form, one having all the characters of an oidium, and the other showing slightly septate threads, which in their lateral branches developed sporangiæ (sporidia), out of which the spores proceed. He states his opinion that the structures known as aphthæ exhibit mostly two forms of fungus; one truly forming sporangiæ (sporidia) with spores, and one only forming coccidiæ; the latter exhibiting what was ordinarily termed oidium albicans. This oidium he considers to be only an undeveloped form of the other, which is probably a leptomitus.

In connexion with microscopical investigation, it may be well here to bring to notice a fluid which Dr. Lambe[1] speaks most highly of, for the preservation of nerves, ganglia, the retina, cancer cells, and delicate protein-holding tissues. It is used by Paccini, and is of the following composition:—Corrosive sublimate, 1 part; pure chloride of sodium, 2 parts; glycerine, 13 parts; distilled water, 103 parts. This is to be left to stand for two months, then mixed with distilled water in the proportion of one to three parts of water, and then filtered. By means of this fluid, as the red corpuscles are precipitated and hardened by it, retaining their form, the corpuscles may be counted.

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[*] Note sur le Muguet; Gazette Médicale de Paris, No. 26.

[†] Lehre vom Soor: Virchow's Archiv, Band vii. p. 1. 1854.

[‡] Wochenblatt der Zeitschrift der Kaiserl. Königd. Gesellschaft der Aerzte zu Wien. Juin 29th, 1857.

There is also a paper, "Ueber das Aufbewahren Mikroskopischer Präparate," by Dr. Schmidt of Frankfort, in the "Archiv zur Förderung der Wissenschaftlichen Heilkunde."

We have not space for any abstract of the following papers, which are of interest:—Ueber die Theilung der Zellenkerne, by Rudolph Virchow.[2] Zur kenntniss der Niere, by Otto Beckmann.[3] (The latter appears to be a very interesting paper, containing a description of the microscopical appearances of the kidney in various forms of disease, and alluding to the observations of most modern writers on the subject). Ueber die Bedeutung der Bindegewebe Körperchen für die Entwicklung und insbesondre für das Wachsthum der krebsigen Geschwülste, by Dr. E. Wagner.[4] Neue Beobachtungen über Amyloide Degeneration, by Rudolph Virchow.[5] Ueber den Bau der Lungen, by Mandl.[6] Three Cases of Enchondroma, by Voisin.[7] Formation of Crystalline Carbonate of Lime in the Bony Lamellæ of Enchondroma, by Clemens.[8] Infusoria in the Intestines of Man, by Malmsten.[9] Microscopic Observation on the Circulation of the Vessels of the Eye in Living Animals, by Waller.[10] Filaria Medinensis, by Waller.[11] Development and Structure of Human Teeth, by Magitot.[12] Tumour formed by a Mucous Cyst within a Sebaceous Follicle, by Baughet.[13]

HALF-YEARLY REPORT ON FORENSIC MEDICINE, TOXICOLOGY, AND HYGIENE.

By Benjamin W. Richardson, M.D., L.R.C.P.

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I. Toxicology.

Poisoning by Chloroform, taken by the Mouth.—Henry Thompson, a private soldier in the 2nd Cavalry of the United States Army, having previously made an ineffectual attempt to destroy himself, which resulted in a slight wound, determined, on April 13th, 1857, to attain the same purpose by swallowing nearly two ounces of chloroform. Dr. Charles H. Smith, who records the case, saw the man about fifteen minutes after he had taken the poison. An empty vial lying near had evidently contained chloroform, of which substance the breath of the patient also smelt strongly. He had already vomited, but could not be roused from insensibility; the breathing was stertorous, the pulse about sixty. To empty the stomach, the stomach-pump was used, and a pint-and-a-half of warm water was twice injected into the stomach, and twice pumped out, loaded with fumes of chloroform. Two drachms of spirit of ammonia were introduced into the stomach before the withdrawal of the tube. After removing the tube, vomiting occurred, but the pulse became feeble, the breathing slow, and the eyes insensible to light. The effect of the cold douche on the head was tried for a few minutes with seeming advantage, the pulse growing stronger, but falling again. The douche was therefore discontinued. The surface becoming cold, the patient was wrapped in five or six blankets, a large stimulating enema was given, and mustard cataplasms applied. For the next hour (between 12 P.M. and 1 A.M.) the symptoms were more unfavourable; the respiration was very slow and feeble; the face purple; the pulse reduced to forty, feeble, scarcely discernible, and intermittent. At one o'clock a gradual improvement commenced, and by 2 A.M. the respiration was easy, the pulse sixty, feeble, but regular. The insensibility continued until 5 A.M. of the 14th. At 8 A.M. the pulse was at ninety-eight, and there was burning thirst; the tongue was coated, and the fauces were red; he had pain in the stomach, and rejected everything. The patient stated that the vial, which was a two-ounce one, was nearly full of chloroform. A blister was applied to the epigastrium, and as there had been no operation from the bowels, an ounce of sulphate of magnesia was administered, but vomited. A turpentine and oil enema was administered, with a large quantity of warm water, which brought away large stools. In the evening milk was rejected by the stomach, as was also a laudanum draught. On the following day (15th) he did not sleep. He suffered from an incessant hacking cough, and the pain in the throat continued. There was pain in the abdomen; the tongue was dry, and thickly coated. The stomach retained cold water, but rejected castor oil. An emena caused several stools. Warm fomentations were applied, and at bedtime three grains of the extract of henbane were given. On the 16th there was a restless night; there was pain in the region of the liver, and jaundice appeared; the pulse was 110; the skin was hot and dry; the expectoration was somewhat rusty; there was no crepitation, but the respiration was harsh behind. Ten grains of mass hydrarg. were given, and half-a-dozen cups were placed over the region of pain. Tea and toast and milk were relished; and the bowels were operated on several times in the day. The jaundice was increased in the evening. Three grains of henbane were repeated in the evening. On the 17th the pulse was at ninety-six; the skin was soft and moist; the pain in the throat and over the liver had disappeared; the conjunctiva and skin were very yellow. Half-an-ounce of the tartrate of potassa and soda was administered, From this date improvement took place, and the jaundice decreased, Pain in the right shoulder, and in the region of the liver, was met by mercurials, cups, and blisters. By the last day of the month he was well.—*American Journal of the Medical Sciences*, Oct. 1857.

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[1] See an article, On the Preparation of Microscopical Objects, in Virchow's Archiv, Band xi. Heft 2, p. 186.

[2] Virchow's Archiv, Band xi. Heft 1, p. 89. [3] Ibid., p. 8; and also, Band xi. Heft 2.

[4] Archiv für Physiologische Heilkunde, Band i. Heft 1, p. 158. 1857.

[5] Virchow's Archiv, Band xi. Heft 2, p. 188.

[6] Gaz. Hebdom. 4, 23 and 25, 1857.

[7] Gaz. d. Hof. 39 and 42. 1857. [8] Deutsche Klinik, 22. 1857.

[9] Virchow's Archiv, p. 302. Sept. 1857. [10] Ibid. p. 338. [11] Ibid. p. 352.

[12] Archiv. Générales, p. 48. Jan. 1858. [13] Ibid. p. 71.

[The use of the stomach-pump was in this case most reasonable. But here, with the exception of a supply of fresh air, the treatment should have ceased, the body being left to itself to throw off the volatile poison. The administration of a large dose of ammonia, although in accordance with the routine practice of the day, we pronounce unhesitatingly to have been not merely useless, but pernicious, tending by its physiological action to promote the continuance of the very symptoms it was intended to remove. The after-administration of purgatives, while yet the surface of the stomach was injected and irritable, seems to us equally objectionable. The stomach ejected the purgative dose as a new poison: in other words, Nature corrected the practitioner.]

Poisoning by Belladonna: Recovery.—Dr. G. Höring relates the case of a man who, having a pain in his stomach, had given to him a mixture containing half a drachm of extract of belladonna in half an ounce of spirit of wine, with directions to take eight or ten drops twice or thrice daily. On the second night (September, 1855), the pain returning, he drank the whole of the fluid which remained (quantity not stated) at 1 A.M. This was followed by *malaise*, vomiting, faintness, and loss of consciousness. At half-past 5 his face was growing red and hot. The eyelids were half closed; both eyes were turned upwards, and their vessels were strongly injected; the pupils were widely dilated; the face, neck, and chest were much swollen; the breathing was laborious and rattling; the pulse was thirty-seven, the radial artery being full, hard and firm to the touch; the skin of the body was hot and dry; the limbs could be moved easily. The patient could not be roused by shouting or shaking. A vein being opened in his arm, the blood, which flowed slowly, was dark-coloured and thick. After the application of cold lotions to his head, with sinapisms, hot vinegar fomentations, and vinegar clysters, consciousness gradually returned, and he passed a yellow-green, slimy evacuation. He was put in a bath at 100° Fahrenheit, and eight leeches were applied behind the ear. The symptoms which now appeared were, great difficulty of swallowing (but unaccompanied by any redness of the mouth or fauces), dryness of the mouth, thirst, with violent headache, and a feeling of pressure on the eyes. He was ordered to drink copiously of water, and to have a mixture of nitre. In three hours he fell into a quiet sleep; after which he perfectly regained consciousness and power of speech. The pupils became again moveable, and the injection of the vessels nearly disappeared. Headache, lassitude, and double vision continued during several days. Recovery was perfect.—*Würtemberg. Correspondenz-Blatt*, 30, 1857; and *Schmidt's Jahrbücher*, Band xcvii., 1858, No. i.

Researches on the Physiological Action of certain Poisons.—Professor Kölliker has performed a number of experiments on the physiological action of curare, conia, strychnia, opium, nicotine, veratria, and hydrocyanic acid. His observations have been chiefly made on frogs; but rabbits and dogs have also been used. The following is the summary of the comparative results arrived at:

1. *Muscular irritability.*—(*a*) Some poisons (curare, and probably conia) paralyse the nerves in the interior of muscles, without diminishing the muscular irritability, which even lasts longer than usual. (*b*) Other substances (veratria, and probably extract of black hellebore) do not act at all on the nerves, but kill the muscles. (*c*) Other substances (as hydrocyanic acid and its preparations) paralyse both nerves and muscles. (*d*) Muscles whose nerves have been paralysed by curare, very often, when locally irritated, manifest only local contractions, rather of a tetanic nature. (*e*) Those muscles which have been greatly fatigued by the violent tetanic contractions excited by opium, strychnia, or galvanism, are less irritable, and lose their irritability more quickly than other muscles.

2. *Cadaveric rigidity.*—(*a*) The period at which cadaveric rigidity appears is independent of the state of the nerves or muscles; experiments on animals poisoned with curare, show that the muscles whose nerves are completely paralysed, become rigid more slowly than the others. (*b*) The poisons which paralyse the muscular fibres (veratria and hydrocyanic acid) produce rigidity more rapidly. (*c*) The violent tetanic action induced by opium, strychnia, and electricity, produces rigidity at an early period. (*d*) The application of certain substances (as hydrocyanic acid) to the muscles, retards rigidity; that of other poisons (as veratria) favours it.

3. *Action on the blood-heart and on the lymphatic hearts.*—(*a*) Those poisons which paralyse the nerves (curare, coniine) but slightly modify the action of the heart; at most, the number of beats is slightly increased at first. If the heart is cut into pieces, it is only the portions supplied with ganglions which continue to beat. (*b*) The poisons which act on the muscles paralyse also the heart, and soon render it rigid; with prussic acid this state is accompanied by extreme relaxation, which is absent when veratria is used. (*c*) Poisons which

produce tetanus act slightly on the heart; but in a case of poisoning with opium, each paroxysm of tetanus was accompanied by a brief arrest of the heart's action during diastole. (*d*) The lymphatic hearts of frogs are paralysed by the poisons which paralyse the peripheric nerves. They therefore do not possess intrinsic mobility. (*e*) During the tetanus produced by strychnia and opium, these hearts are arrested in a state of contraction. (*f*) Electric stimulation of the spinal cord by a constant current, produces tonic contraction of the lymphatic hearts, but it comes on more slowly than in the voluntary muscles.

4. *Action on the nervous system.*—(*a*) The special mode of action of certain poisons (curare) which attack only the motor nerves, and act on the sensory nerves only at a later period, or not at all, points out differences between these nervous fibres which no other kind of experiment had hitherto even led one to suspect. (*b*) Experiments with curare prove that nerves completely paralysed are capable of regaining their lost power as conductors. (*c*) Tetanic poisons are capable of completely paralysing the motor nerves by over-excitement. (*d*) Other poisons (as curare, conia, nicotine, and hydrocyanic acid) paralyse the motor nerves through the medium of the blood; the primary action of the first three is on the expansions of the nerves, that of the acid on their trunks. (*e*) In certain circumstances, nervous tubes, with their medulla coagulated, are still capable of conducting impressions—a fact which proves that the axis-cylinder is the only active element. (*f*) The deleterious action of some poisons on the nerves is manifested more slowly when they are applied locally than when they are injected into the blood; the cause seems to be that the nervous tissue is more slowly penetrated by them.

In general, poisons manifest special affinities for certain organs. There are as yet only nervine poisons and muscular poisons. The former are divided into three groups: (*a*) those which act on the grey matter (veratria, strychnia, opium); (*b*) those which affect the nerve-tubes (curare, conia); (*c*) those which act on both elements (hydrocyanic acid, nicotine, ether). In each group there are excitants and paralysers. No poison is known which acts exclusively on the muscles, although veratria may almost be included in such a class. We possess no blood-poison—that is to say, no substance which so modifies the mutual physiological relations of the normal elements of the blood as to render the fluid injurious. Poisons act on organs both through the medium of the blood and when applied locally, and the rapid action of violent poisons is naturally explained by the rapidity of the circulation.—*Archiv für Pathol. Anat. und Physiol.*, Band x., 1856; and *L'Union Médicale*, Février 25, 1858.

Experiments with Bibron's Antidote to the Poison of the Rattlesnake.—Dr. William Hammond, assistant-surgeon of the United States army, communicates some interesting details on the above subject. Some four years since, Prince Paul of Wurtemburg communicated to M. De Vesey the results of some experiments performed before the French Academy of Sciences by Professor Bibron. According to Prince Paul, Professor Bibron allowed a rattlesnake to bite him in the lips and cheeks, and by taking the antidote discovered by him, prevented all alarming symptoms, and in fact suffered no inconvenience therefrom.

The antidote in question, as stated by Prince Paul, is prepared according to the following recipe:—℞ Potassii iodidi, gr. iv.; hydrarg. chlor. corros., gr. ij.; brominii, ʒv.; ten drops of this mixture, diluted with a tablespoonful or two of wine or brandy, constitute a dose, to be repeated if necessary. It must be kept in glass-stoppered vials, well secured. Prince Paul forwarded a small quantity of this mixture to M. De Vesey, who used it successfully in the cases of two men bitten by rattlesnakes near his residence in Iowa.

During a recent expedition to the Rocky Mountains, Dr. Hammond had several opportunities of testing its efficacy, and since his return performed additional experiments with it. The results upon the whole were exceedingly satisfactory; and he thinks that, when taken in time, it may be entirely depended upon in the poisonous wounds of the rattlesnake, and perhaps also in those of other venomous serpents.

Experiment 1.—Heinrich Brandt, acting hospital steward, was bitten, on the 2nd of July, 1857, in the index finger of the right hand by a large rattlesnake (*crotalus confluentus*), which he was in the act of putting into a jar for preservation. The snake inflicted a very deep wound, and hung by his fangs to the finger for a second or two before it could be detached. About four minutes after the bite, and before much pain or swelling had ensued, Dr. Hammond administered one dose of Bibron's antidote. The symptoms almost immediately disappeared. Forty minutes after giving the first dose, the pain and swelling returned, attended with considerable throbbing. Dr. Hammond repeated the medicine, and in less than five minutes the finger had regained its natural appearance, and all pain and pulsation had vanished. The man remained perfectly well, and resumed his duties in an hour from the reception of the injury.

Experiment 2.—A very large rattlesnake was made to bite a young wolf (*canis occidentalis*), about three months old. The serpent wounded the animal severely in the left flank. Fifteen minutes after the bite the leg was much swollen, and the wolf exhibited signs of great uneasiness, yawning, stretching, and looking about in an anxious manner. These symptoms continued to increase in intensity till inability to stand, drowsiness, and slight convulsive movements ensued. Dr. Hammond now (thirty minutes from the infliction of the wound) gave six drops of the antidote, with the almost instantaneous disappearance of the observed symptoms. In a few minutes afterwards the animal ate a large piece of meat.

Experiment 3.—On the following day the same snake was made to bite the wolf three times in the space of five minutes, in the flank, neck, and chest. In two minutes after the last bite, the effects of the poison were evidenced by the inability of the wolf to stand, gasping respiration, and a fixed expression of countenance. Some delay occurred in getting the antidote ready; and before Dr. Hammond could administer it, all signs of life had apparently ceased. Nevertheless, he placed six drops far down the throat, where it seemingly remained, as no effort of swallowing was perceived. However, in one minute respiration again commenced, and the heart could be felt to pulsate. The wolf lived for twenty-seven minutes, and then died comatose.

The rapidity of the action of the poison in this case, owing to the large quantity introduced into the system, prevented a successful issue. The good effects of the antidote were, however, sufficiently apparent to every observer; and Dr. Hammond has no doubt, that had it been given before the faculty of swallowing was lost, the life of the animal would have been saved.

Experiment 4.—After Dr. Hammond's return to Fort Riley, a large *crotalus confluentus*, which he had brought with him from the Rocky Mountains, was made to bite a dog five months old. The wound was made in the right shoulder. The poisonous effects of the bite commenced in ten minutes, causing gasping respiration, inability to stand, &c. He attempted to give a dose of the antidote, but the dog would not swallow; and he had no means at hand by which to introduce it into the stomach. He again tried to administer the remedy, but without success. The third dose was inhaled into the lungs. By this time the dog was perfectly senseless, and was dead in forty-five minutes after the infliction of the bite. Very slight swelling occurred in the wounded part.

Experiment 5.—Forty-five minutes after the last experiment, the same snake was made to bite another dog of the same litter as the preceding. The wound was inflicted in the lower jaw, very near the mouth. At the end of three minutes, and before any violent symptoms ensued, a dose of the antidote was given. The dog swallowed it readily. Five minutes afterwards, the animal seemed very uneasy. Respiration was accelerated, and he preferred to lie down in the shade. At the end of about fifteen minutes he could stand with difficulty; and as the sickness appeared to be on the increase, another dose was administered. Nearly half of this was lost. Slight swelling was now perceived in the face and neck. When roused, the animal would walk a few yards, though with great difficulty, and evidently preferred rest and quiet. About one hour after the bite he lapped a little milk, and seemed to be better, wagging his tail when spoken to, and walking with less effort. No increase of the symptoms occurred; and in fact the dog was to all appearance perfectly well in two hours after the reception of the injury, except that slight swelling of the under jaw still remained. Dr. Hammond saw no more of him till next morning, when this had disappeared, and he was as active and lively as usual.

Dr. Hammond had no further opportunities of repeating the experiment with other animals. During his absence, however, the antidote was used by Dr. Coolidge, United States army (to whom he was also indebted for assistance in the latter experiments) in the following case, of which he favoured Dr. Hammond with the subjoined account:—

"In July, 1857, a girl, aged fifteen years, was bitten at Fort Riley by a rattlesnake, on the dorsal aspect of the first phalanx of the ring finger of the right hand. In a few moments the finger became swollen and bluish, and when I first saw her, about ten minutes after the receipt of the wound, the fore-arm had begun to swell, and pain extended to the elbow. She was depressed, and somewhat nauseated. An elder sister had sucked the wound from the first instant. There being sufficient space above the wound, I applied a cord tightly around the finger, and then made a free incision down to the bone. As soon as the articles could be procured from the hospital, I gave ten drops of the bromine mixture diluted, and injected into the wounded finger the preparation recommended by Dr. David Brainard, of Chicago, Illinois;* viz., ℞ Iodinii, gr. x; potasii iodidi, gr. xxx; aquæ destillatæ, fʒj.: solve. The patient expressed herself relieved after the first dose of the bromine; a second was given in twenty minutes. The solution of iodine injected caused severe smarting pain; the fluid and air from the syringe could be felt a little above the wrist, and ultimately caused suppuration of the cellular tissue on the back of the hand. Nothing more was done. The girl recovered."

In conjunction with the mixture referred to in this paper, it will be observed that Dr. Coolidge laid open the wound, and injected the cellular tissue with tincture of iodine, as recommended by Dr. Brainard, of Chicago, so that the favourable result in this instance cannot be attributed solely to the use of Bibron's antidote.—*American Journal of the Medical Sciences*, January, 1858.

Poisoning by the Œnanthe Crocata.—Dr. Robert Grahame, surgeon of her Majesty's ship *Wellington*, reports two cases of poisoning by the herb œnanthe crocata, or wild celery. On the morning of February 13th of the present year, the barge of the *Wellington* was ordered ashore at Cambletown, for the purpose of being scrubbed, and the gear cleaned by the boat's crew. Close to the spot selected for their operations ran a small stream, along the banks of which grew abundance of the plant in question. The men had strayed along the stream, and some of them had pulled up the plant, washed the root or tubers and eaten them, their example being speedily followed by the rest. For some time after the arrival of the men with the boats, nothing occurred to induce any suspicion. About twenty minutes past ten A.M., Dr. Grahame was summoned to Robert Owen, who was labouring under an epileptic form of attack. The man was in a state of almost immovable rigidity, insensible, moaning, and breathing stertorously. The countenance was livid; the eyes were fixed, the pupils dilated; sanguineous foam issued from the mouth; there was opisthotonos; the pulse was very feeble, and the heart's action scarcely perceptible; the lower jaws were firmly locked, the tongue being much inflamed, and protruding. Dr. Grahame, suspecting poison, had produced on inquiry some of the root of the plant from which the man had eaten. Brandy, then an emetic of sulphate of zinc, then a full dose of sesquicarbonate of ammonia, were given, but to no purpose; the man expired calmly about ten minutes later. The rest of the men who had partaken of the root were now alarmed. To all a zinc emetic was administered, followed by copious draughts of tepid water. In five of the cases, including the man who died, the spasmodic accessions were severe and successive; in one the more prominent symptom was extreme restlessness, approaching to mania. In almost all there were semi-delirium and jactitation, if not convulsion, and in one or two prostration, requiring repeated small doses of brandy and ammonia. In two of the cases the men had said nothing, expecting to brave it out, when they suddenly fell in convulsive fits.

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* See Annual Report of the Smithsonian Institution, 1854.

William Walsh, ship's corporal, who had been assisting, smilingly and without fear reported that he had eaten some of the root. While an emetic was being prepared, he became giddy. The emetic acted well; but soon afterwards convulsive fits came rapidly on, and ended in two hours in his decease. The body of one man was opened by Mr. Ironson. The stomach was empty; tough viscid tenacious mucus adhered to the inner lining, which was much congested. In the ileum, small portions of the root were found. On opening the abdomen, and previously to examining the stomach, an overpowering and pungent odour of the plant became diffused, resembling that of celery seed. In all the cases, the men complained of constant and continued eructations, strongly favoured by the plant.—*Medical Times and Gazette*, March 6th, 1858.

Experimental Researches on the Action of Alcohol, with special Relation to the degree of Dilution with Water.—Drs. Jacobi and Falck have performed a series of experiments with various mixtures of water and alcohol—viz., 99, 80, 70, 60, 40, 20, and 10 per cent. of alcohol. The mixtures were thrown into the crops of pigeons, the stomachs of rabbits, and the jugular veins of dogs, and the following results were observed.—*Alimentary canal.* The injection of alcohol itself produced distinct pathological changes only where it had come into direct contact with the membrane; and hence these were absent in the dogs. In rabbits, the morbid appearances were limited to the small intestine; while in pigeons they began in the crop and ended in the second or third part of the alimentary canal. They were most strongly marked in the crops of pigeons and the stomachs of rabbits—their degree corresponding with that of the concentration of the alcohol. The injection of ten cubic *centimètres* of absolute alcohol into the crop was followed during life by frequent attempts to vomit; after death the mucous membrane of the crop was found quite destroyed, indurated, broken up, and much corrugated; the muscular coat was hyperæmic; the vessels were very full, and the blood in them was coagulated and thickened. Concentrated alcohol therefore acts primarily by producing congestion, hyperæmia, and stasis; and then, by removing the water from the membranes and blood-vessels, it destroys the former and produces coagulation in the latter. In proportion to the dilution with water, these results were less apparent; while the phenomena of irritation became more distinct, and the areolar tissue of the crop was infiltrated with yellowish exudation. When twenty per cent. of alcohol was used, there was a thorough softening and desquamation of the mucous membrane; with ten per cent. no remarkable change was observed. The quantity of fluid found in the crop was very small, or almost none, with the lowest per-centages of alcohol; while after the injection of the strongest (eighty to ninety-nine per cent.), the quantity of fluid found exceeded that which had been thrown in. This is explained partly by the removal of water from the tissues, partly by the impediment to absorption arising from the chemical changes in the mucous membrane and the coagulation of the blood. The changes in the other parts of the alimentary canal corresponded with those in the crop, but were less in degree: the glandular coat of the gizzard was generally sound—the muscular coat always so, being protected by the horny lining of the organ. In rabbits the appearances corresponded in general with those described above. In these animals the changes produced by removal of water from the tissues were not found when eighty per cent. of alcohol was used; while in pigeons they were found at sixty per cent.: this is explained by the fact of the stomach never having been quite empty in the rabbits. In consequence of paralysis of the muscles of the cardiac orifice, alcoholic fluid escaped from the mouth. The mucous membrane of the upper part of the alimentary canal was red in proportion to the degree of concentration; the redness disappeared when from ten to twenty per cent. of alcohol was employed. In the *liver* and *kidneys* great hyperæmia was the only morbid appearance.—*Heart and blood.* The action of the heart was greatly increased, except where death was immediately produced by the injection of concentrated alcohol into the blood; after death it was found distended, especially on the right-side (as well as the large veins) with blood. There was no remarkable change in the blood of animals killed by injecting alcohol into the crop or stomach; while in the two dogs experimented on, the blood with which the alcohol had come into contact was firmly coagulated: with seventy per cent. the clot had the ordinary appearance; while with eighty per cent., it contained, besides fibrin, a large quantity of coagulated albumen and hæmatin.—*Lungs and respiration.* In the pigeons the respiration was at first irregular in frequency and laborious; at a later period, up to death, it was short and quick. In rabbits it always increased at the beginning of the experiments, and considerably diminished towards the end. In the dogs, after the injection of from twenty to sixty per cent. of alcohol, the breathing was more or less quickened, then gradually became normal. The lungs in these animals were found collapsed, pale, and bloodless—the result of coagulation in the right heart. In the pigeons and rabbits the lungs were always much engorged with blood. In pigeons and rabbits, as stupefaction advanced, there was a sinking of temperature, often strongly marked, up to the time of death; while in dogs, after the injection of a mixture containing from twenty to sixty per cent. of alcohol, the commencement of stupefaction was always attended by a slight increase of heat. —*Nervous System.* The phenomena connected with the central organs of the nervous system were strongly marked; but it was only in the cases in which the alcohol was injected into the blood, that the symptoms corresponded in duration and intensity with the proportion of alcohol used. The injection of ten per cent. of alcohol into the crops of pigeons was followed by only a transient lassitude and somnolency. When a more concentrated mixture was used, the birds became unable to stand; then they reeled about and fell; and at last (when from forty to ninety-nine per cent. of alcohol were injected) became perfectly stupefied and unconscious, in which state they continued until death occurred, at periods varying from forty-seven minutes to three hours and twenty minutes. In experiments with twenty per cent. of alcohol, the pigeons lived twenty-four hours without being perfectly stupefied. The affection of the motor system was manifested by constant trembling of the body; twitchings of the wings in many cases; convulsive shiverings of the entire body, repeated from time to time in one instance; and in many slight opisthotonos. In rabbits the phenomena were similar; but in these the injection of twenty per cent. of alcohol soon produced perfect stupefaction and anæsthesia, from which the animals recovered in the course of some hours. The effects of different degrees of dilution were clearly observed in the cases of injection into the blood. When twenty cubic *centimètres* of a mixture containing twenty per cent. of alcohol were used, the only effect produced was a slight and rapidly transient tottering: the injection of the same quantity of mixture, but containing forty per cent., at first rendered the animals unable to raise themselves up; after this they tottered violently and frequently fell, and were for a time in a state of anæsthesia. These symptoms were observed in a higher degree after the injection of sixty per cent. of alcohol. On *post mortem* examination, the appearances presented by the nervous system did not correspond with those observed as the result of alcoholic poisoning in man; for in the central parts of the nervous system, with the exception of more or less hyperæmia of the membranes of the brain and spinal cord, there were no remarkable changes.—*Deutsche Klinik*, 22, 26, 31, 34, 1857; and *Schmidt's Jahrbücher*, Band xcvii., 1858, No. 1.

Poisoning by Haschick.—Among various kinds of haschich, Professor SCHROFF obtained at Bucharest a preparation termed *biriminqi*, which is used in doses of ten grains for producing laughter. It is in the form of cakes, very tough, and difficult to break; externally it is nearly black, and dull; a section through the middle is of a dirty grey-green colour; the fracture is uneven; the odour very slight, manifesting Indian hemp at the fractured surface only; the taste is rather insipid than bitter aromatic. By long chewing, the tough masses are gradually dissolved, leaving a small quantity of a hard crumbly substance. Long-continued chewing produces irritation of the throat. This kind of haschich differs from that which is brought from Egypt, and still more from the weaker preparations.

Dr. Heinrich, who in previous experiments conducted by Professor Schroff had manifested no remarkable susceptibility to the influence of haschich, took, on May 6th, 1857, at half-past five P.M., ten grains of the preparation described above. He chewed it gradually; and soon felt irritation in the œsophagus, heartburn, slight *malaise*, and dryness of the throat. In an hour and a half he began to chatter nonsense, and everything that he saw assumed a ridiculous aspect. He was violently agitated; his face and eyes were red; and his body felt very hot; he felt light in his movements. This state continued about twenty minutes, and was followed by great depression. Everything seemed too narrow for him; his sight was lost; his face was pale; he had a feeling of flow of blood towards the head; and when he was lifted up, he experienced a sensation of pressure in the pit of the stomach; his pulse was very small, and sometimes could not be felt for a considerable time. His conviction was, that he was about to die. The symptoms increased; frightful images appeared before him; and his consciousness was greatly obscured. As consciousness returned, the images became less horrible; but the patient could not restrain the tumultuous stream of ideas which passed before him, so that he was obliged to speak constantly, until he again entirely lost consciousness for a few minutes. When Dr. Schroff saw the patient at a quarter-past eight; the latter recognised him at once. He lay in bed; his countenance was of a healthy red colour, but somewhat sunken; the pupils were moderately dilated; the iris was sensitive to light; the eye was easily moved; the brightness of the eyes was unchanged; the conjunctivæ of the bulbs of the eyes were somewhat injected; the forehead was cool; the pulse in the carotid and temporal arteries was weak, and less frequent than was normal; the heart's beat was very feeble, sometimes scarcely perceptible; the pulse at the wrist sometimes could not be felt for a minute or more; then it would become more distinct, and rose to seventy-eight (the patient's normal pulse being from fifty-eight to sixty). The variations in the pulse recurred several times within an hour. The breathing was light and regular; the abdomen was somewhat enlarged, but painless; the limbs were cold, sometimes trembling, easily moved, and obedient to the will; the skin was not tender to the touch; the urine was passed involuntarily. The patient was able to sit up and drink. The senses were normal, with the exception of cutaneous sensibility, which was dull. The idea that he must die returned several times, and was always in direct ratio with the fall of the pulse.

The characteristic symptoms of this case of poisoning were the great and lasting depression of the heart's action, accompanied by the fear of death, after a short stage of excitement. The case differed from others of poisoning by haschich in the absence of inclination to sleep, but agreed with them in the absence of convulsions. It also supports the idea, that Indian hemp and its preparations exercise over the imagination a power which is possessed by no other agent; and shows the great diversity in the symptoms, according to the individual. In some of Dr. Schroff's experiments, thirty grains of alcoholic extract of Indian hemp, taken in the course of a few hours, only affected the head slightly; while in other cases one grain produced delirium, great acceleration of the pulse, restlessness, and subsequently great depression. The drug and its preparations therefore evidently require great caution in use.—*Wiener Wochenblatt*, 40, 41, 1857; and *Schmidt's Jahrbücher*, Band xcvii., 1858, No. 1.

Poisoning with Lead amongst Laceworkers.—A young girl, employed in bleaching the lace called "applications de Bruxelles," experienced for some time violent pains in the head. She went into hospital, where, after four days of intense suffering, she died. The physician attributed the symptoms to poisoning by lead. An inquest was held, and analysis of the viscera, especially of the liver and brain, furnished a large quantity of lead. On inquiry into the health of the lacemakers, it was found that they had experienced on many occasions symptoms of lead poisoning, especially those who had been employed in bleaching the flowers. This operation consists in beating into the surface of the material powdered carbonate of lead, for the purpose of hiding defects. Hence this branch of industry is attended by serious effects on the health of the employed.—*Journal de Pharmacie*, Février, 1858; and *L'Union Médicale*, Février 22, 1858.

Poisoning by Opium in Infants: Recovery.—Case I.—A male child, aged three weeks, had administered to it, at short intervals, by the advice of a midwife, on account of restlessness, three clysters, each containing thirty-five drops of Sydenham's laudanum. All the clysters were retained. Dr. Blanc found the child with its eyes closed, its eyelids swollen, its pupils normally dilated, but immovable; its face and lips, as well as the rest of the body, swollen and livid. Respiration was slow and stertorous; expiration was very slow; the nose was cold; the limbs were cold and stiff; the temperature of the body was much diminished, in spite of the application of external warmth; the pulse was imperceptible; the child could not swallow. The legs were fomented with warm water, linseed-meal, and mustard; and two clysters were given, containing coffee and two drops of medicinal prussic acid. In a quarter of an hour the child moved its head; the breathing became more frequent; and the colour normal. At the end of half an hour the child opened its eyes; and after several repetitions of the clyster, with a drop of prussic acid, and the passing of some firm fæcal matter, it was quite well the next day.—*Revue de Thérapeutique Médico-Chirurg.*, 17, 1857.

Case II.—In the end of December, 1857, a healthy male child, aged seven months, had recommended for it by a midwife a teaspoonful of chicory syrup; but received instead a teaspoonful of Sydenham's laudanum. Fortunately, the nauseous taste of the medicine caused the rejection of a portion; but about two-thirds of the quantity were swallowed. There was no vomiting at first, but somnolency soon set in, and in twenty-five minutes the child was sound asleep. A *pharmacien* in the neighbourhood prescribed coffee, and advised a physician to be instantly sent for. Dr. O'Rorke saw the child an hour and a-half after the accident. The face was of a cadaveric aspect; the lips were livid; the cheeks and nose were cold; the eyes were hollow, the pupils contracted, the eyelids half closed, the eyes turned upwards; the breathing was noisy and stertorous; the pulse was scarcely perceptible; the limbs were cold, but the trunk retained its normal heat; the heart-beat was strong; the limbs were relaxed; no urine nor fæces had been passed. The arms and legs were pricked with a pin without effect. Dr. O'Rorke had the child removed from bed, and prepared an infusion of 60 grammes of freshly-ground coffee in 90 grammes of boiling water; sinapisms were applied to the body and lower limbs, and hot bricks to the feet. By assiduously pricking the child with a pin in the arms, chest, neck, and face, reflex movements were excited, and the child at last began to cry and struggle. Its eyes regained some expression, though still fixed; the face became less livid, and the extremities somewhat warmer; but it again sank into a state of coma, from which it had to be roused by pricking, flagellation, and pinching. At the same time a large spoonful of strong coffee was administered by the mouth. In about an hour and a half after Dr. O'Rorke's arrival, the child passed a large quantity of urine; which, on being subsequently tested with ioduretted iodide of potassium, gave distinct evidence of morphia. In the course of the day, 60 more grammes of coffee were given; and two strong purgative enemata were administered. Seventeen hours after the accident, the child was out of danger, though still dull. The appearance of the face was improved: the pupils were slightly moveable. The next day the infant took food, and in four days was quite well.—*Gazette des Hôpitaux*, 20 Février, 1858.

II. Wounds and Injuries.

Rupture of the Trachea from a Fall.—A very remarkable case, which might under some circumstances lead to judicial inquiry, is recorded by Dr. Atlee, of Lancaster, United States. On the 22nd of July, 1856, a boy, four years of age, in running across the street, tripped at the kerb-stone and fell, striking his neck with force against the scraper at the side of the door of his father's house. The blow caused for a few moments extreme difficulty of breathing, and Dr. Atlee was sent for. He (Dr. Atlee) reached the house not more than five minutes after the injury had been received. The child was then seated upon his mother's lap, his head resting against her arm, and breathing naturally, or nearly so; there was some blueness of the lip, but this soon passed off; on his countenance there was not much appearance of distress. Where the neck had come in violent contact with the scraper, there was not the slightest mark upon the skin. Dr. Atlee was about to congratulate the family upon the slightness of the injury, when the child, struggling to free himself from his mother's arms, threw himself violently backwards. He at once became enormously swollen, and in a moment was dead. The cause of the swelling was due to the entrance of air into the cellular tissue, and it extended over the head, the neck, the trunk, and the upper extremities to the ends of the fingers. At the sternum, the finger, before reaching the bone, penetrated fully an inch. It was unfortunate that a *post mortem* examination was not permitted, but the evidence afforded by Dr. Atlee is, we think, conclusive. He shows that when the neck had struck the scraper, the rings of the trachea had been separated from one another, but that they had remained in place until dislocated by the act of throwing the head backwards. When this occurred, the air contained in the lungs was forced violently into the cellular tissue of the body.

But few cases of this kind have been recorded. Dr. Atlee refers to two only; one reported by Ryland, in his treatise 'On the Diseases and Injuries of the Larynx and Trachea,' page 250; the other reported by Dr. Robertson in the *Lancet* for the 6th of September, 1856.—*American Journal of the Medical Sciences*, January, 1858.

Assault and Murder under the Influence of Haschich.—A few months ago a Moor, named Soliman, aged about twenty, residing near Algiers, was tried for murdering and attempting to murder several Jews, under the following circumstances. On August 22nd, after having several times drunk wine flavoured with aniseed, he entered, about noon, into a Moorish *café*, and remained there until three o'clock smoking haschich, which is by the Algerines called *kiff*. On leaving the *café* he quarrelled with two Jews, whom he compelled to accompany him; one of these he attempted to strike, but was restrained by a passer-by. Soliman then ran home, armed himself with a cudgel, and returned to the place where he had left the Jews, but they had disappeared. He then re-entered the *café*, where he began again to smoke *kiff* and to eat *maadjaun* (a preparation of Indian hemp). In a furious state, he left the *café* about four o'clock. The day was the Jewish sabbath; and according to their custom, the women of that nation were standing before their doors in their holiday clothes. This sight no doubt recalled to his mind the quarrel in which he had lately been engaged; for suddenly, and without any provocation, he madly assaulted all the Jews in his way, until some Frenchmen, attracted by the cries of his victims, disarmed him. Seven persons were more or less dangerously injured, one of whom soon died.

When Soliman was brought before the magistrate, he was in the most brutal state of intoxication. In his examination he declared that he recognised none of his victims, and that he remembered nothing of the occurrence. He had, he said, no motive for enmity against the persons whom he had maltreated. It was proved, however, that on the morning of the same day, when quite sober, he had said, "If any one would bring me fifty Jews I would slay them all, with all my heart." But these words were rather the expression of the inveterate antipathy of the Mussulman for the Jew than a real threat. It became, then, necessary to determine the influence of *kiff* on the cerebral functions.

The Orientals make a deplorable use of preparations of Indian hemp, which they smoke under the name of *kiff*, *haschich*, or *tekhouri*. Sometimes they fry the leaves in fat, butter, or honey, so as to extract the active resinous portion; this preparation, termed *maadjaun* or *tomowese*, they eat. The smokers and eaters of *haschich* are called *haschischins*, whence the word *assassin* is said to be derived. The Algerine Moors, besides using Indian hemp in the ways described above, sometimes add to it opium or tobacco for smoking; sometimes they eat it mixed with fat, sesame, cloves, cannella, or ginger; and, when insensible to its effects from long use, they add nux vomica, and thus for a time succeed in procuring a state of stimulation which soon ends in insanity. More than one-half of the natives received provisionally into the insane wards of the civil hospital in Algiers, have been smokers of *haschich* or eaters of *maadjaun*: and scarcely one of them is ever found to recover.

The professional report made on Soliman was, that he was not master of himself when he committed the crimes with which he was charged; and that, although he had the power of selecting his victims, he was not at all conscious of what he was doing. The accused, however, was sentenced to five years' imprisonment.

This is probably the first instance in which a legal tribunal has been called on to decide in the case of a crime committed under the influence of *haschich*, and to extend to it the principle ordinarily admitted, that intoxication forms no excuse for a man's actions.—*Journal de Médecine et de Chirurgie Pratiques*, Novembre, 1857.

III. Hygiene.

Military Hygiene. Clothing of Soldiers.—Dr. Coulier, of the Imperial Military School of Medicine and Pharmacy, has carried out some very elaborate experimental investigations, as respecting the relative value of the various materials used for the clothing of soldiers. The following are the conclusions at which Dr. Coulier has arrived:—

1. The colour of the clothing has but little apparent influence on the loss of heat.

2. Every fabric is capable of absorbing, in the latent state, a certain quantity of hygrometric water. This quantity is considerable in woollen material, less so in hempen fabric, and still less so in cotton. This absorption occurs without immediate loss of heat to the human body.

3. The colour of the fabrics has a great influence upon the absorption of solar heat; and it is sufficient, whatever else may be the nature of the clothing, to modify conveniently the external surface of the clothing, to gain the advantages gained by white materials when exposed to the intense heat of the sun.—*Journal de la Physiologie*, Janvier, 1858.

On Anders, a Disease communicable from the Bovine Species to Man, and probably from one Human Being to another.—In the provinces of Limousin and Auvergne there is, according to M. Lemaistre of Limoges, a disease among horned cattle, which has the name, in the former province, of *endaï*, and in the latter of *anders*. The appearances in cattle differ somewhat from those in man.

In horned cattle the first sign of the disease is a pimple of the size of a grain of wheat; this discharges a reddish yellow fluid, which hardens into a crust somewhat like impetigo. This scab is easily raised, and the skin beneath is dry, tumid, and somewhat wrinkled. Round the first other pimples appear; they do not suppurate, but dry up and desquamate. The ring thus formed has a greyish white colour; it goes on increasing by the formation and desquamation of fresh pimple, and destroys the hair in its course. Several rings may exist in the same animal, in various stages; they rarely exceed a five-franc piece in size. The eruption is attended with much itching; it is mostly confined to the head, face, and neck, and almost always to one side. Each ring of eruption passes through its stages in about a month; but a succession of them may reappear during a considerable time. The disease is generally more obstinate in winter than in summer. In recovery the skin remains bare for some time, but at last the hair grows gradually. The disease is purely local, and is popularly believed to be contagious among cattle, in support of which belief several instances are adduced. A young animal is more liable to the disease than an old one: if a cow has *anders*, the calf will inevitably be affected. Nothing satisfactory seems to be known of the treatment.

In man, M. Lemaistre has not seen the eruption in its earliest stage. When fully developed, it appears at a distance as a bright red round patch, slightly projecting above the skin, not exceeding a five-franc piece in size. On close examination it is found to consist of small red pimples, slightly desquamating on the surface; they are generally redder towards the circumference of the patch than in the centre. There is much itching in the parts affected towards evening. It is altogether local, and principally confined to the face, fore-arms, and backs of the hands. It lasts from one to several months, and always ends in recovery. In some instances the appearance of the eruption has been traceable to contact with the animals so affected: in others this evidence has been wanting, and the disease has rather appeared to have been communicated from one human being to another. In the treatment, sulphur-bath appears to have been most useful; the local application of nitrate of silver produced only a transient effect.—*L'Union Médicale*, 26 Janvier, 1858.

QUARTERLY REPORT ON PATHOLOGY AND MEDICINE.

By **Edward H. Sieveking**, M.D.

Fellow of the Royal College of Physicians, Physician to, and Lecturer on Materia Medica at, St. Mary's Hospital.

Enormous Cyst in the Brain, proceeding from the Pituitary Body. By Dr. F. A. Zenker, Professor of Pathological Anatomy in Dresden. (Archiv für Path. Anat., Band xii. Hefte 4 and 5.)

A girl, aged six, died in the hospital at Dresden with symptoms of hydrocephalus, which had followed a "nervous fever" nine months previously. The cranium was thin throughout, translucent at many points, and the different bones easily separable at the sutures; numerous small warty exostoses were found at the inner surface after removing the dura mater. The surface of the hemispheres was flattened. On separating the hemispheres, the corpus callosum was seen raised up, convex, and fluctuating; the lateral ventricles much distended, and containing in their posterior halves a large quantity of colourless serum. The anterior portion of the ventricles was lifted up by a tense cyst of an irregularly oval form, of the size of a hen's egg on the right, of a duck's egg on the left side; the cyst extended from before and below, upwards and backwards. The thin but firm walls of the cyst showed a smooth shining surface, traversed by injected vessels of a brownish hue, owing to the contents; at the front of the right hemisphere the cyst projected almost to the surface. On raising the anterior lobes of the brain, the cyst showed itself occupying the sella turcica, from which it could be easily detached. The cavity of the sella was hollowed out to the extent of a hazel-nut, but nowhere was there a trace of the pituitary body. The infundibulum was also wanting. The different portions of the cyst, at first sight appearing to form three different cysts, intercommunicated in the median line, at the anterior portion of the third ventricle. It contained a watery, dark reddish-brown, turbid fluid, containing blood-corpuscles, dark glomeruli, fat, cholesterin; but no cells.

Three Cases of Infantile Apoplexy. By Joseph H. Wythes, M.D. (North American Medico-Chirurgical Review, Jan. 1858.)

The first of these three cases occurred in a child, aged three, found dead in bed one morning, after having the day before complained of pain in the left ankle, supposed to have been the result of a sprain. The wrists and ankles were strongly contracted, and the left leg, arms, and back purple; the left leg slightly swollen. An extravasation of blood, perhaps half a fluid ounce, was found between the cranium and dura mater. The membranes were much injected, and there was a large clot at the posterior part of the "septum." The membranes in many places were strongly adherent. There was an appearance of blood infiltrated in the posterior lobes, particularly of the right side; and there was a coagulum in the right ventricle.

In the second case, a boy, aged three months, death also supervened suddenly, without premonitory symptoms. When seen by Dr. Wythes, a few hours later, he was cold; the hands and feet contracted, particularly those of the left side; the mouth slightly drawn on one side; and the whole posterior surface purple. The vessels of the arachnoid and pia mater were considerably congested, and the whole cerebral tissue softened to the consistency of melted butter. A little serum was observed at the base of the left hemisphere of the cerebrum, but nothing abnormal in the ventricles; the membranes of the cerebellum and medulla oblongata were strongly congested. The other viscera were healthy. We should be disposed to doubt the propriety of terming this a case of apoplexy; not so, however, the third.

The third occurred in a child, aged three months, who was found dead in bed. The muscles of the hands and feet were much contracted; foam issuing from the mouth and nose. Face purple; purple congestion of the skin of the back and limbs. The membranes of the brain healthy, but its substance much congested. On slicing it seemed full of bloody dots. A small clot of blood was found in each ventricle; lungs congested; a serous effusion in the pericardium; liver large; other organs healthy.

On Amblyopia and Amaurosis, in connexion with Bright's Disease of the Kidneys. By Dr. A. Wagner. (Archiv für Pathologische Anatomie, Band xii. Hefte 2 and 3.)

The existence of definite changes in the retina has been shown by Türk and others to accompany the amaurotic condition which sometimes occurs as a complication of Bright's disease. Dr. Wagner has within four years met with eighteen cases in which such changes were detected; the total number of cases of Bright's disease observed during the same period being 157. Having discovered material alterations after death in the retina of a patient who had not complained of any defect of vision during life, Dr. Wagner frequently examined the eyes of patients labouring under Bright's disease with the ophthalmoscope. Three times he discovered changes in the retina which were not so serious as to cause a derangement of vision. In three other cases the patients complained of nebulous sight, while the ophthalmoscope showed derangement in the amount of blood in the internal membranes of the eyes; and once, small extravasations in the retina. In ten cases there were demonstrable pathological changes in the eye, with more or less severe intermittent or persistent nebulosity of vision; in one case only was the blindness complete, and lasted to the time of death. The cases are detailed with great minuteness, but we must confine ourselves to a brief statement of the general summary.

The external examination of the eyes yielded no definite results of importance. The ophthalmoscope showed the lens and vitreous bodies to be normal, except that in one case there was a trifling and temporary opacity of the latter. The main deviations were seen in the choroid and retina. In the early stages of the morbid process there was hyperæmia (arterial or venous) of the retina alone, or of the choroid, conjoined with smoky opacity of the fundus of the eye. This fuliginous opacity commences at the papilla of the optic nerve, and extends peripherically over the inner surface of the globe; it occupies the retina, the vessels of which seem to lie above the opacity; the author believes it to be due to an exudation into the retina. At a later stage the opacity increased, while the vessels diminished, and appeared to become obliterated. Punctated and larger extravasations, and white or yellowish spots of irregular but sharp outline, were also perceived, generally in the vicinity of the papilla of the optic nerve. The yellow spots are different from those which are found in sclerotico-iriditis resulting from atrophy of the choroid. In eight cases the eyes were examined after death; the yellow spots seen with the ophthalmoscope, were then resolved into dull white patches, in which the retina was thickened and indurated. The papilla of the optic nerve was found prominent, owing to an opaque white deposit; the vessels were, as shown by the ophthalmoscope, either subjacent to or upon the opacities and extravasations. The morbid product was shown by the microscope mainly to occupy the retina, and to consist of three different elements:—1. Fine dark molecular granules, soluble in ether, and probably fat. 2. Shining, faintly coloured granular globules, also soluble in ether, probably ganglionic cells in a state of fatty degeneration. 3. Rhomboidal structural flakes, unchanged by reagents, probably indurated fibrin. The red spots in the retina were invariably proved to be exuded blood. The optic nerve, whenever examined, was found to be normal.

An Epidemic of Spinal Congestion, observed at Niort. By Dr. GAUNÉ. (Arch. Géné., Jan. 1858.)

An epidemic of spinal congestion and meningitis made its appearance in September, 1856, in the foundling asylum for females at Niort, which is remarkable both on account of its course and its termination. With the exception of one, there were no cephalic symptoms, while a cure was effected in all. Nineteen were attacked, ten of which the author regarded as congestion, nine as decidedly inflammatory. It appears that there are sixty-five girls in the establishment, varying from six to twenty-one years; the nineteen who were attacked were all seized between the 10th September and 6th October, and, excepting one, were all cured by the 8th December.

The affection came on suddenly in some, in others it was preceded by formication, heaviness of the lower extremities, and general malaise, symptoms which lasted from twenty-four to forty-eight hours; the intellect was unimpaired, excepting in the solitary case in which the head was involved; all of the patients lost the power of motion; and nearly all had severe pains in the course of the spinal column, which were increased by movement and by pressure; in three the dorsal muscles were so rigid as to constitute actual ophisthotonos, in two others the rigidity existed in a lower degree. Some febrile movement was detected in nearly all. Those in whom the disease amounted to meningitis kept their bed from fifty to seventy-five days; those affected with congestion, for fifteen to forty days. The treatment was antiphlogistic; consisting in general bloodletting wherever feasible; the application of leeches and cupping-glasses on the spinal column; sedatives and purgatives internally, and in three, tartar-emetic in large doses.

No spinal cause was traceable to which the epidemic could be attributed; no alteration of any kind had taken place in the mode of living or regimen of the girls, so that the medical men who were consulted on the subject were, with Dr. Gauné, compelled to attribute it to the influence of changes of temperature.

The author gives four of the cases in detail; the following is an abridgment of one of these; it is one of those called meningitis, between which and the congestive cases, the only difference is one of intensity:—Julia, aged fifteen, of a good constitution, was suddenly seized, on the 21st September, while menstruating, with numbness of the lower extremities, inability to stand, and pains in the lumbar region of the spinal column, increased by pressure; pulse eighty-six, full; tongue normal; fair appetite. Sixteen leeches were applied to the thighs, and mustard poultices to the feet; an antispasmodic draught was administered internally; no benefit being obtained, the patient was bled three days after; on the 28th, leeches were re-applied to the lumbar region of the column, opiates being given from time to time. On the 1st October, the fever continued; the patient could not move without severe pain; and the legs, though preserving their sensibility, had lost all power of motion. Tartar-emetic was now prescribed internally, with narcotic frictions along the column. From this date improvement commenced; on the 3rd, the opisthotonos had almost entirely disappeared, some movement returned in the lower extremities, the fever ceased, and the appetite was restored. The tartrate of antimony was continued up to the 4th October, from which date the treatment consisted in the occasional repetition of counter-irritation and purgatives, and on the 15th November the patient was discharged cured, having been fifty-seven days in the infirmary. Excepting that the treatment was less severe, and the disease of less duration, the congestive were the same as the inflammatory cases; so that it is unnecessary to give the details of one of the former.

On Errors of Diagnosis in Diseases of the Heart. By Professor FORGET. (L'Union Médicale, Dec. 3rd, Dec. 5th, and Dec. 8th, 1857).

If difficulties of diagnosis were more frequently dwelt upon than they are, the advances of medical science would be greater; at present the formulæ of books too often mislead the student, and induce in him either carelessness of observation or mistrust in his own powers, because the facts that come before him are too frequently at variance with what he is directed to hear and to see. The author of the present series of papers points out the difficulties that occasionally envelop the determination of cardiac lesions; more particularly when a bellows-murmur is not to be detected in disease of the aortic and mitral valves. Professor Forget gives the details of four cases which have recently occurred in his own practice, and in which the diagnosis was incomplete owing to this circumstance. We subjoin the heads of these cases:—1. A man, aged fifty-six, admitted April 17th, 1857, of a strong constitution, had acute articular rheumatism twenty years previously; cough for several years; habitual dyspnœa for six months, followed by progressive general anasarca. Expression anxious, face swollen and cyanosed, extensive œdema; cough, much dyspnœa, mucous expectoration streaked with blood; thorax sonorous, general sibilant and mucous râles, varying in size. Heart-beat feeble, without blowing murmurs. Pulse small, soft, ninety. Veins of neck dilated. Digestion normal; urine acid, non-albuminous. The patient at first improved under treatment, but on the thirteenth day double pneumonia supervened, and six days later he expired. The post-mortem revealed old pleuritic adhesions, straw-coloured serum with albuminous flakes in the right cavity; both lungs partly carnified, red, and friable; the bronchi of deep red, and filled with sanguinolent mucus. The whole pericardium adherent; the heart large (*volumineux*), with black, copious coagula in the right cavities; a pale one in the left ventricle; the aortic valves ossified, thickened, malformed, causing narrowing and insufficiency; the same was the case with the mitral valves, which were much thickened, so as to form a narrow fibrous ring, causing narrowing and insufficiency.

Dr. Forget points out that the error committed was in assuming the source of the venous stasis to be in the lungs, whereas it originated in the left side of the heart; the diagnosis was, however, qualified by the addition, that a bruit de soufflet might be absent owing to the "feebleness of the heart not sufficing for its production." The left side of the heart was not dilated, owing to the aortic and mitral valves both being narrowed, so that the ventricle did not receive more blood that it could force on. 2. A female, aged fifty-two, admitted 11th May, 1857. The following case contrasts strongly with the preceding one, because, although the symptoms were the same, we shall see that the lesions differed materially. Average constitution, subject to difficult breathing from her infancy, cough for thirty years, increased for three months. For six weeks œdema of feet, which has now spread over the rest of the body. Face cyanosed, considerable anasarca; abundant viscid mucous expectorations, with fine moist râles scattered over both lungs; feeble impulse of heart; beat irregular, no abnormal sounds; small, feeble, irregular pulse. Digestion normal; no albumen. Diagnosis, pulmonary obstruction, consecutive dilatation of right side of heart, without positive signs of lesion of the left side; possible latent valvular lesion. Gradual increase of symptoms. Death on the 26th May. Autopsy: old pleuritic adhesions; lungs gorged with blood and serum; the bronchi red, and full of mucus. A few black dry tubercular deposits at the apices. No hypertrophy or dilatation of the left side of heart; the aortic and mitral valves normal; dilatation of the right side of the heart. The supra-renal capsules in a state of fatty degeneration; and in the parenchyma of the right one were seven or eight small uric acid calculi. 3. Female, aged 73, admitted June 19th, 1857. Cough for above a year; severe for two months; face cyanosed; œdema of legs and ascites; dyspnœa, mucous expectoration, sibilant and moist râles over the whole thorax; dulness at the left base posteriorly, with obscurely blowing respiration. Heart beats feeble, irregular, and unaccompanied with râles. Urine dark, non-albuminous. Pulse feeble, irregular, 112. Diagnosis: pulmonary congestion, dilatation of right heart and consecutive anasarca; no indication of disease of the left heart. Death three days later. Autopsy: old, partial, but extensive adhesions between the pericardium and heart; cellular bands and recent false membranes uniting the two serous laminæ. Under the false membranes the surface of the heart was injected, dotted, and scattered over with small milk spots, slightly projecting and resembling tubercles. The parietes of the heart were slightly dilated and hypertrophied; the aortic valves thickened but moveable, and without malformation.

M. Forget observes that this patient died of an old pericarditis, which prevented the occurrence of the characteristic friction sound, but gave rise to the tumultuous action of the heart, the pulmonary engorgement, and other symptoms.

4. A female, aged fifty-seven, admitted June 23rd, 1857. Dyspnœa for four months, with palpitation, cough, and abdominal pain; anasarca for six weeks; on admission, cyanosed, considerable œdema of lower and left upper extremities, considerable ascites; respirations fifty-six; sibilant and other râles throughout lungs; slight dulness and ambiguous vocal resonance at base and posteriorly; small, frequent, irregular, pulse; heartbeats feeble, obscure, irregular, not abnormal in sound; masked by pulmonary râles; no enlargement or extended dulness of præcordial region. Death on following day. Autopsy: straw-coloured effusion in pleura, hypostatic congestion of lungs; bronchi red and full of mucus. Pericardium containing about ten ounces of limpid serum; heart if anything reduced in size. Mitral and aortic orifices healthy. Chronic peritonitis.

Professor Forget observes, with regard to these four cases, that they resemble each other in the general and in several local symptoms of disease of the heart, and by the absence in all of the blowing murmur characteristic of valvular lesions. They differed in presenting very dissimilar lesions. The first showed considerable alteration in the two orifices of the left heart; in the second there was no primary lesion of the heart; in the third there was old pericarditis with adhesions; and in the fourth secondary hydro-pericardium. As the symptoms in the four cases closely resembled each other, the diagnosis of necessity was deceptive or remained doubtful.

The author draws the following conclusions. Wherever the obstruction in the venous circulation may be, the general symptoms are the same. Many cardiac lesions are only revealed by the general disturbance of the circulation, and have no symptoms peculiar to themselves; the majority of local symptoms of cardiac disease belong to several lesions, and even to diseases unconnected with the heart; the coarse blowing murmur is the most characteristic of local symptoms, and almost always indicates valvular lesion; the lesions most commonly indicated are narrowing and insufficiency of the valves; but the *bruit* is often absent in valvular lesions, and under these circumstances the diagnosis of cardiac affections is very obscure.

Contributions to the Anatomy and Pathology of the Membranous Portion of the Septum Ventriculorum. By Hans Reinhard. (Archiv für Patholog. Anat. und Physiol., Band xii. Hefte 2 and 3.)

This paper, which is a posthumous publication, investigates the relations of the triangular space at the base of the inter-ventricular septum, which is closed by fibrous membrane, a normal condition in the human heart.* It occupies the space lying between the internal and posterior aortic valves, the apex of the triangle pointing upwards; the base is from 15 to 20 millimetres (0·6 to 0·8 in.) in extent; the vertical diameter averages 9 millimetres (0·35 in.). The description of four specimens contained in the Wurzburg Museum is given, in which the triangular space of the septum was the seat of intra-cardiac aneurism:—

1. The heart of a young subject, presenting no external abnormity; thickening of the endocardium in the left ventricle; the pulmonary valve fenestrated; the mitral thickened, shortened, and slightly adherent at the edges. In the place of the thin spot under the semilunar valves there was the orifice of an aneurism in the left ventricle; the aneurism was cylindrical, and 0·35 in. deep; round the orifice the endocardium was laid in folds. Viewed from the right ventricle, the sac was seen to project behind the bicuspid, and to present indications of secondary dilatations. The writer does not decide whether it is a congenital aneurism or not; nor could any serious derangement have arisen from it during life, as it was not of sufficient size; but had it existed longer, it would probably have been ruptured, as the parietes were very thin.

2. The second preparation was taken from a man aged fifty-three. The heart was hypertrophied; the endocardium of the left ventricle opaque. The mitral had thickened and shortened margins; the curtains of the aortic valves thickened; the left one was fenestrated. An aneurism was found in the left ventricle, the orifice being immediately under the right valve of the aorta, and of sufficient size to admit the tip of the forefinger; the muscular tissue terminated abruptly at the base of the orifice. Seen from the right side, a thin membranous sac, of the size of a pigeon's egg, was observed to project rather into the right auricle than the ventricle. At the projecting portion the bicuspid was deficient. The writer is inclined to assume a congenital malformation in the present instance.

3. This heart was probably from a child, being small. It presented in the septum of the auricles a partial defect, in the shape of a small orifice, above which the foramen ovale, which was completely closed, was distinctly visible. In the left ventricle the part corresponding to the membranous portion of the septum was absent; in its place was the orifice of an aneurismal sac, which, however, was not as patent as in the preceding cases, but was somewhat concealed by the anterior curtain of the mitral being attached to its margin by a tendinous cord, and by some tendons being even extended into the sac, and attached to its posterior wall. In the right ventricle the sac occupied the greater part of the upper part of the septum, and was bounded by a curtain of the bicuspid.

4. This heart showed traces of extensive pericarditis. The mitral was slightly thickened, the aortic orifice was surrounded by a hard, dense ring, that projected considerably. The right semilunar valve of the aorta was converted into an aneurism, which showed a perforation communicating with the ventricle. Another perforation was found in the membranous portion of the septum ventriculorum; the edge of the orifice was surrounded by ragged dendritic vegetations; the edges of the perforation were in mutual apposition, and required to be separated so as to show the opening. A considerable loss of substance was found in the tricuspid at the part directed towards the arterial cone. A considerable spot of softened muscular tissue existed in the auricular septum.

A Contribution to the Question of Fatty Degeneration of the Heart. By H. Weber, Physician to the German Hospital in London. (Archiv für Pathol. Anat., Band xii. Hefte 2 and 3.)

The author relates the histories of two cases of heart disease, in which, after death, the microscope showed the hearts to have undergone extensive fatty degeneration. The muscular tissue, on analysis and comparison with two analyses of healthy hearts, proved to contain less fat than the latter, as will be seen by the following numbers:—

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* The Reporter was the first to draw attention to this fact in the Manual of Pathological Anatomy (1854), by Drs. Jones and Sieveking, p. 315. Dr. Hauschka's and Dr. Peacock's observations on the subject were published in 1855.

1. **Diseased hearts:**

	Left ventricle.	**Right ventricle.**	**Septum.**
A. Specific gravity	**1·0478**	**1·0406**	**1·0475**
Water	**80·159 per cent.**	**82·279 per cent.**	**80·815 per cent.**
Fat	**2·242 „**	**1·914 „**	**2·350 „**
B. Specific gravity	**1·03553**	**1·03051**	**1·03064**
Water	**81·374 per cent.**	**82·531 per cent.**	**82·789 per cent.**
Fat	**2·739 „**	**2·515 „**	**4·145 „**

2. Healthy hearts:

A. Water	**79·381 per cent.**	**82·027 per cent.**	**79·306 per cent.**
Fat	**3·630 „**	**3·109 „**	**3·815 „**
B. Water	**79·317 „**	**81·728 „**	**—**
Fat	**3·216**	**2·318 „**	**—**

Dr. Weber refrains from drawing a positive conclusion from these cases, but suggests that possibly what we term fatty degeneration consists, not so much in the deposition of fat as in the isolation of the fat, normally a constituent of the muscular fibril, owing to the retrograde metamorphosis of the tissues.

Two Cases from the Practice of Dr. Liharzik. (Wochenblatt der Zeitschrift der k. k. Gesellsch. der Aerzte in Wien, Dec. 7 and 14, 1857.)

The first of these two cases is in every way remarkable—both the accident itself, as the manner in which a cure was established, approaches the marvellous. A young gentleman, aged fifteen, was walking in the country with his tutor, and put an ear of barley into his mouth, with the stalk protruding from the mouth. While conversing he was suddenly seized with a cough, and the ear disappeared. He had one or two attacks of coughing, but he was so well in the evening, that an excursion was agreed upon for the next day. The weather prevented this; but the boy caught a cold from going to sleep in an open verandah, in consequence of which he was under medical treatment for some weeks. It was not till above three months after the disappearance of the ear of barley, which happened in Ischl, that Dr. Liharzik saw him immediately after his return home to Vienna; he then was in good health, and the only thing that alarmed his parents was the repeated occurrence of a short cough, accompanied by the expectoration of dark-grey mucus, which was occasionally tinged with blood. Dr. Liharzik found that the left thorax was normal throughout; the right thorax did not expand fully on deep inspiration; anteriorly the percussion and respiratory murmurs were normal, but along the back the percussion was dull, and at the lower angle of the scapula the respiratory murmur was indefinite and indistinct. Dr. Liharzik, not being able to believe that the ear could have slipped through the glottis, diagnosed chronic pneumonia. There was little or no fever for some time; but about a fortnight after his return, dyspnœa, increased, cough, and febricitations set in; two days after (on the 15th of October), during a severe attack of cough, he suddenly threw up half a coffee-cupful of fœtid pus, streaked with blood. Professor Oppolzer, who was consulted about this time, diagnosed traumatic pneumonia, produced by the presence of the ear of barley. Repeated expectoration of large quantities of pus, tinged with blood, took place, but the patient's strength did not fail. On the night of the 28th of October, after continuous and very harassing cough, the ear of barley was ejected with great force. Enveloped in pus and mucus, it lay in the mouth with the stalk outwards, so that the patient could draw it out. It appeared that, previously to its passage into the respiratory passage, one lateral half had been bitten off, so that the part swallowed only contained two rows of grain.

The cough and expectoration soon diminished after this occurrence; the fever subsided, and, at the time of the report, the patient was convalescent.

The second case is also one of considerable interest, in which a large abscess over the region of the heart caused symptoms inducing a belief that the heart itself was dislocated, and lay upon, instead of within, the thorax.

Contributions to a more accurate Knowledge of the various Forms of Typhus. By PROFESSOR LEBERT, in Zuric. (Vierteljahrsschrift für die Practische Heilkunde. xiv. Jahrgang. 1857.

In this paper, which is the first of a series, the author dwells upon the characters of what he calls "abortive typhus," and which he thinks it the more important thoroughly to understand, because by that means we may learn to appreciate the value (or rather the uselessness) of abortive methods of treatment. Dr. Lebert speaks of his "abortive typhus" as being identical with what we call febricula. Among 800 cases of "abdominal typhus" (typhoid fever), which he has observed in Zuric, not less than 170, or above 20 per cent., belonged to this denomination. The diagnosis between the abortive and the complete form of the disease is often impossible during the first three or four days, and is only rendered certain towards the end of the first week, or in the course of the second, by the entire or comparative absence of the features characteristic of confirmed typhoid. Such are—delirium, stupor, diarrhœa, with the characteristic evacuations, roseola, enlargement of the spleen, bronchitis, fuliginous covering of the tongue and lips, loss of power, and emaciation. All these symptoms may, however, occur in more or less feeble indications; at the same time "abortive typhus" is not at all contagious, while true typhoid is very much so. Dr. Lebert is of opinion that curative proceedings are of little use, and that the success of the abortive method of treatment boasted of by some writers is to be explained by the fact of the frequent occurrence of the undeveloped form of the disease. In one-seventh of all the cases of abortive typhus, moreover, the abortive treatment by emetics and purgatives had been employed before the admission of the patients into the hospital, and the consequence had been rather to enfeeble them, and to protract the disease. Dr. Lebert, from all his observations and experiments, concludes that the disease is *ab initio* either abortive or complete. His treatment in the abortive form is mainly expectant and symptomatic, with mild nutritive diet.*

QUARTERLY REPORT ON SURGERY.

By JOHN CHATTO, Esq., M.R.C.S.E., London.

I. *On a New Operation for Hydrocele.* By M. CARRON DU VILLARDS. (Moniteur des Hôpitaux. 1857. No. 128.)

M. CARRON DU VILLARDS, a French practitioner in the Antilles, has devised a modification of Larrey's operation for hydrocele, in consequence of the bad effects which result from injection in that part of the world. The accidents produced by it are tetanus, acute hematocele, suppuration, acute orchitis, easily passing into the condition of induration, gangrene, and, when only weak injections are employed, relapse. The author has himself never met with this consecutive tetanus, but practitioners settled at Cuba have assured him that it is of frequent occurrence there. He has, however, met with a great number of cases of hematocele consequent on injection, either with or without organic transformation of the tunica vaginalis. So frequent are these accidents, that a great number of persons repair to the United States for the purpose of having

[* Want of space compels us to postpone the remainder of the Report, containing some interesting matter relating to abdominal and other diseases.—ED.]

the injection performed. In such bad repute is it among the Creole population and practitioners, that they content themselves with repeated palliative punctures by means of a lancet, the frequent repetition of which almost always leads to the degeneration of the tissues of the scrotum described by Larrey. The author has very frequently met with this form of elephantiasis of the scrotum in the Antilles, where it is known as the Barbadoes disease.

The operation which he has devised in lieu of injection, has now been performed by himself in 50 cases, producing 48 radical cures, and only 2 failures; and subsequently to the presentation of the memoir, M. Camilleri and others have operated 187 times, with but 7 relapses. It is attended with no accidents and but little pain, is adapted for all the complications and varieties of hydrocele, is of easy execution, and requires little confinement or after-treatment. The patient is placed on a high bed, with his buttocks well raised by means of a cushion, and the situation of the testis having been recognised, the operator, taking the lower part of the hydrocele in his hand, while an assistant presses it downwards, punctures the most dependent part of the tumour with a strong and narrow lancet, which he passes slowly in. As soon as fluid escapes, he slides a long narrow trocar along the blade of the lancet, keeping the point of the instrument within the canula until the upper boundary of the tumour is reached. Having reached this point, the canula is pressed against the tissues, so as to project them somewhat externally, in order to be certain that neither the cord nor a pulsating vessel can be felt in front of it. A piece of cork is next placed against the projected tissues, and against this the trocar is forcibly driven by the application of the palm of the hand to the handle of the instrument. A counter-opening is thus at once effected, just as the jewellers pierce the ears for ear-rings. The stiletto of the trocar is now withdrawn, and replaced by a grooved silver wire, which traverses the two apertures, and is left *in situ* on the removal of the canula. Spirit lotions are applied around the scrotum, and during twenty-four hours a slight discharge of fluid takes place. After this period, inflammation is set up and the secretion is no more reproduced. The scrotum becomes afterwards red, hard, and painful, as in acute orchitis, but it rarely requires treatment. More frequently it has been found necessary to encourage action by placing stimulant ointments in the groove of the wire. On the twelfth day (the patient being usually able to get up by the third) the wire is removed, the patient wearing a suspensory until the twenty-fifth or thirtieth day, by which time he is usually radically cured.

II. *On Urethral Intermittent Fever.* By M. Chassaignac. (Moniteur des Hôpitaux, 1857. No. 135.)

This is the name M. de Chassaignac attaches to the febrile attack which all surgeons have observed as a consequence of catheterism, and which, if it were desired to indicate the cause giving rise to it, might be termed catheteric fever. It is a curious point to determine, whether the contact of the instrument with the entire length of the urethra is necessary for the production of the paroxysmal attacks, or whether it is sufficient for one portion of the canal to have undergone such contact, and in that case, which portion. Judging from the facts known to him before the case which gave rise to these observations came under his notice, M. Chassaignac was disposed to believe that neither the membranous nor the prostatic portion of the urethra was the portion in question. Thus he never met with an instance of such febrile paroxysm being produced after catheterism in the female, nor is he aware of any one who has ever met with one. A natural inference would be that it is not observed in woman, because the paroxysm arises from the contact of the instrument with a portion of the urethra which does not exist in her. An opportunity offered itself for confirming this conjecture, by the counter-proof of the induction of the paroxysm by the exclusive catheterism of the portion of the urethra which is proper to man. This occurred in the case of a patient suffering from multiple urinary fistulæ. The catheter being passed from one of these to the meatus, and back again from the meatus into the fistula, no difficulty or pain occurring, an intense intermittent paroxysm was produced. The patient had had the catheter passed before, and had borne one fixed in the urethra without such effects having been produced. It was quite certain that on this occasion the instrument had not come in contact with either the membranous or prostatic portion of the urethra, or with the neck of the bladder; and until farther information upon the subject, M. Chassaignac feels justified in localizing in the bulbous or anterior portion of the urethra the physiologico-pathological process which gives rise to the production of the paroxysm in these cases.

III. *On Bending and Partial Fractures of the Long Bones.* By PROFESSOR HAMILTON. (New York Journal, vol. iii. pp. 318—339.)

This paper is founded upon certain experiments performed by Professor Hamilton upon the legs of chickens, and references to cases that have occurred in his practice.

1. *Bending of the Long Bones.* This is considered *first* in relation to the *immediate* and *spontaneous return of the bone to its original form*. The possibility of the occurrence is amply demonstrated by the experiments, in which the bones were bent to an angle of 25°, and immediately resumed the straight position; dissection, made a few days afterwards, exhibiting no traces of injury having been done to the bone. The author therefore infers the possibility of this occurrence taking place in the long bones of an infant. *Secondly*, with the exception of some few cases in which, while one of the bones of the fore-arm has been broken and the other only bent, Dr. Hamilton is not aware of any instances of *permanent bending* of the long bones. None of the cases so reported by authors have been verified by dissection, and he believes, with Gibson, that they are really examples of partial fracture. None of his experiments furnished any such results. Of course no one denies that permanent indentation of the flat bones may take place.

2. *Partial Fractures.* These are considered under the same divisions: *First*, with *immediate restoration of the bone to its original form*. Although the existence of this form seems to have been occasionally recognised, it has not excited any special attention. The few cases that have been met with in Professor Hamilton's practice have occurred in the clavicle. Of 72 fractures of this bone, 17 were partial; and of these 4 were immediately followed by spontaneous restoration of form. Of 5 partial fractures produced in chickens, it was observed in 1. In the cases of fracture of the clavicle, the force has operated indirectly on the bone from the shoulder. A hard node-like swelling is observed at about the middle of the clavicle, unaccompanied by movement or crepitus, with the skin only slightly or not at all tender, and the axis of the bone being unchanged in direction. The *second* form, *without* immediate and spontaneous restoration of form, comprises the great bulk of cases of partial fracture. It probably differs from the other variety in the extent of the bony lesion, and in the peculiar form and degree of denticulation at the seat of fracture preventing the restoration of the form of the bone. The author has observed it in 13 of 72 cases of fracture of the clavicle, and in 12 of 188 cases of fracture of the radius and ulna. He has met with it in no other bones, although other authors have described it occurring in other long bones. He describes the appearances on dissection of the legs of some chickens which had been partially fractured a few days. Prior to dissection, the limb still seemed bent, but this was found to arise from the subcutaneous effusion of lymph on the side which had been broken. Beneath the periosteum, too, there was a loose, thin, honeycomb deposit of ensheathing callus, which surrounded the bone in three-fourths of its circumference, being wanting exactly along the line of fracture,

the seat of which was thus indicated by an oblique groove. Dissections in the human subject have also been made by Glaser, Camper, Bonn, and Campaignac. The diagnosis is not difficult, the distortion indicating fracture, while the absence of crepitus and mobility, and the mode of production points to its partial character. No great anxiety need be entertained if the bone cannot be completely straightened, the natural form usually being restored after the lapse of a few weeks or months. "The gradual restoration of these bones is due to the same circumstance which produces at other times an immediate restoration—viz., the elasticity of the unbroken fibres; but which elasticity, in this latter instance is, for a time, effectually resisted by the bracing of the broken fibres. At length, however, in consequence of the gradual absorption of the broken ends, this resistance is removed, and the bone becomes straight. If this absorption does not take place, and the fibres continue pressed forcibly against each other, as in the case described by Campaignac, the bone remains permanently bent."

3. ***Fissures.*** In this section the author relates an interesting example of fissure occurring in the scapula, and refers to the fissures of various bones, as described by other authors; but this part of his essay does not call for further notice.

IV. *On Perforation of the Membrana Tympana.* By Dr. Clarke. (American Journal of Medical Science, vol. xxxv. pp. 1—51.)

Dr. Clarke gives a tabular view of 52 cases of perforation of the membrana tympani; and an analysis of these leads him to the following conclusions:—1. Difference of sex does not exert any marked influence upon the occurrence of perforation. 2. Persons of delicate health are not more liable to it than the robust. 3. Disease of the ear occurring in individuals of the strumous diathesis is more likely to terminate in perforation. 4. Both membranes are more frequently perforated than either singly. 5. The external meatus is rarely in a healthy state when an aperture exists in the membrane. This diseased state is sometimes a cause, but more commonly a consequence of perforation. 6. Foreign growths, as polypi and fungus, frequently coexist with, and are often an indirect consequence of it. 7. Otorrhœa is a very common attendant; it is a symptom, not a disease, and is not only a frequent indication, and often kept up by it, but, in a large majority of cases, is the earliest warning of insidious disease that will lead to it. 8. The mucous membrane of the cavity of the tympanum is variously affected by the existence of perforation. It is sometimes of a pale red, without inflammation, but more frequently congested. In rare instances it is covered by a white, dry membrane. 9. About a fifth of all affections of the ear are complicated with or terminate in perforation. 10. An aperture (after it has existed for some time) generally occupies from ⅓ to ½ or ⅔ of the membrane. The smaller its size, the greater facility in its cicatrization. 11. The power of hearing is diminished, but not obliterated in perforation. A simple aperture of moderate size, *i. e.*, uncomplicated with disease of the cavity of the tympanum, or of the meatus, produces only a slight degree of deafness; and a simple one of large size, or even the complete destruction of the membrane does not destroy hearing. 12. Perforation most frequently occurs in childhood. Its most frequent cause is otitis, and it is occasionally produced by accident. The common causes of what might be called perforating otitis are the exanthemata, exposure to cold, erysipelas or eczema of the ear, and improper syringing. 13. The position of the aperture is various. When large, it is central. 14. The condition of the ear and the hearing may be improved by treatment, when the perforation itself cannot be healed. 15. Perforations following the exanthemata, or constitutional diseases, are the least disposed to heal. Those following exposure to cold or local causes, including ordinary otitis, are more likely to heal. Those following accident or puncture heal readily.

V. *On the Radical Cure of Hernia.* By M. GOYRAND. (Gazette Médicale, 1858. No. 8.)

M. Goyrand's remarks apply only to the attempt to effect the radical cure of hernia by employing the omentum as an obturator after the operation. The result of his experience upon the subject is, that all such attempts are futile, and that reputed successes have only arisen from patients not having been watched for a few months after leaving the hospital. In the 35 cases of successful herniotomy that have occurred in his own practice, he has only in 3 cases been enabled to return the hernia without opening the sac; and he has frequently left masses of omentum within the abdominal aperture, with the result, at the very farthest, of somewhat delaying the reproduction of the hernia. Among the examples he relates in illustration is one in which a very large portion of omentum was so left, causing a projection in the groin, and which having suppurated, became during the cicatrising process thoroughly confounded with the crural aperture and the surrounding skin. Still, in little more than a month after the operation the hernia was reproduced. This patient dying four years afterwards, from other causes, the parts were examined, and not the slightest traces of the obturating omentum was discoverable. The omentum had ceased, after the healing, to act as a serous membrane, taking on the ordinary characters of the cellular tissue of the region.

VI. *On Excision of the Trunk of the Second Branch of the Fifth Pair in Facial Neuralgia.* By Professor CARNOCHAN. (American Journal of Medical Science, vol. xxxv. pp. 134—143.)

In this paper is described a new operation devised by Professor Carnochan, for cases of severe facial neuralgia, essentially consisting in vascular congestion or inflammation of the trunk of the second branch of the fifth pair—a condition that may have its origin in various causes. At all events, such was the pathological state of the portion of the nerve removed in the three cases in which he has performed this operation, and for the relief of which mere division of the nerve as it leaves the infra-orbital foramen would be of no avail. "I believe," he says, "that, in such aggravated cases of neuralgia, the key of the operation is *the removal of the ganglion of Meckel, or its insulation from the encephalon.* Where even a large portion of the trunk of the second branch of the fifth pair has been simply exsected from the infra-orbital canal, the ganglion of Meckel continues to provide, to a great extent, the nervous ramifications which will still maintain and keep up the diversified neuralgic pains. Besides, the ganglion, being composed of *gray matter, must play an important part as a generator of nervous power,* of which, like a galvanic battery, it affords a constant supply; while the branches of the ganglion, under the influence of the diseased trunk, serve as conductors of the accumulated morbid nervous sensibility."

The first case in which these views were put into practice occurred in the person of a French physician, aged sixty-seven, incapacited by this neuralgia from following his profession. Commencing in 1851, it recurred at intervals, with gradually increasing severity, until 1856, from which time it became absolutely excruciating, and almost continual. Every anti-neuralgic remedy had been resorted to in vain, when, in October, 1856, he applied to the author, wearied of his life, and willing to submit to any operation. The rationale of this formidable one having been explained to him, he desired its immediate performance. It was therefore executed on the 16th October. We need not describe the procedure in detail, but may merely state that it consisted in trephining the anterior wall of the antrum immediately below the infra-orbital foramen, and following the nerve with the chisel and forceps along the floor of the orbit into the spheno-maxillary fossa, and dividing its trunk close to the *foramen rotundum.* "This severe and trying operation was perfectly justified by the fearful nature of the disease for which it was projected. It is one of those operations which could not be supported by the patient without the influence of chloroform. The handling of so large a nervous trunk with the forceps, and the necessary contact with hard instruments, while separating it from its surrounding connexions, would, I suppose, be beyond human endurance, without the aid of the anæsthetic influence of chloroform or ether. For the rest, the effects of the cicatrices upon the countenance can scarcely be called disfiguring, and the patient speedily recovers without suffering from much constitutional disturbance. . . . . The trunk of the nerve in this case was much larger than natural in nearly its whole extent. The neurilemma was very vascular, and the nervous tissue proper was also engorged and red. The trunk, after its removal, was so red as to have somewhat the appearance of muscular tissue. The length of the nerve removed was a little more than an inch and three-quarters." The recovery was rapid and the relief complete.

The subject of the second case was an Italian, aged fifty-four, who for many years had been the victim of severe neuralgia, all means having been tried, and among others division of the nerve, as it left the infra-orbital foramen, on three or four occasions, with only temporary benefit, and not always that. The above operation was performed, a similar condition of the nerve (which was removed to the extent of two inches, the ganglion of Meckel hanging to it), observed, and the same relief followed. A woman, aged fifty-five, was the third patient, she having been the subject of dreadful suffering at intervals since 1851, and having tried all remedies, including division of the nerve, with only partial benefit. There was considerable hæmorrhage in this case during the operation, from the spheno-maxillary fossa, which was stopped by the employment of compressed sponge. Two inches of the vascular and enlarged nerve were removed, and the relief was complete.

In all these cases the relief from the most excruciating suffering was prompt and complete; but in reference to the permanence of the effect, it is of importance to bear the dates of the operations in mind. The first had been performed fourteen months when it was reported; the report of the second, performed October 10, 1857, comes down to December 8; and that of the third, performed November 5, 1857, to December 3. Any conclusion drawn from the two last cases, or even from the first, would be premature.

VII. *Case of Simultaneous Dislocation of both Shoulder-Joints.* By Dr. H. Van Buren. (New York Journal, 3rd Series, Vol. iii., p. 297.)

An example of this rare accident occurred in the person of a strong, middle-aged man, who fell headlong down a flight of steps. Fracture of the base of the skull, with laceration of the cerebellum, was also produced, and he died in five hours. "Both shoulders were observed, to present the usual physiognomy of dislocation into the axilla, and distinct crepitus could be felt in both sides when the humeri were rotated. On dissection of the right shoulder the head of the humerus was found in the subscapular fossa, lying between the surface of the bone and the subscapular muscle, which had been lacerated and torn up from its attachments to make a bed for it. Its exact position was about 1½ inches below, and 1 inch nearer the median line than the base of the coracoid process. The greater tuberosity of the humerus was broken off, and retained in its normal relation to the glenoid cavity by the capsular ligament and the muscles to which it gives attachment. The capsular ligament, extensively lacerated in front and on its inner aspect, presented an elongated shred stretching from the upper margin of the glenoid cavity downward and inward to the dislocated head, to which it was still attached. The long tendon of the biceps was found occupying its normal relation to the greater tuberosity, having been dragged out of the bicipital groove. The coracoid process of the scapula was fractured through its base, and dragged forward and downward by the action of the coraco-brachialis and the short head of the biceps. . . . . On dissection of the left shoulder a condition of parts was found similar to that described, with the following exceptions: the head of the humerus was displaced more directly downwards, resting upon the anterior margin of the lower border of the scapula, just below the glenoid cavity. The capsular ligament was lacerated on its inner aspects, and less extensively, and the coracoid process was uninjured. The greater tuberosity, however, was fractured off almost exactly in the same manner, and retained its natural position to the glenoid cavity and the long tendon of the biceps."

VIII. *Case of Purulent Ophthalmia in the Fœtus.* By M. Rivaud-Landrau. (Annales d'Oculistique, tom. xxxvii. p. 68.)

M. Rivaud-Landrau, of Lyons, while on a visit to a neighbouring town for the purpose of performing some operations on the eye, was shown an example of an affection which, as far as he is aware, is unnoticed in works on ophthalmology—viz., a case of indubitable purulent ophthalmia occurring in the fœtus. The child was two days old, and born blind. The upper eyelids were closed, and slightly reddened and swollen at their dorsal edges; and they were glued together by dry purulent sanies. On raising them, the conjunctiva was found red and inflamed, and covered with numerous close-set granulations, bathed in well-marked purulent serosity. The globes of the eyes were atrophied, and appeared as two little red balls, granulated like a strawberry, at the bottom of the orbits. There were no traces of cornea or iris. The infant was in a very emaciated condition.

IX. *On the Transcurrent Application of the Actual Cautery in White Swelling.* By M. Notta. (Archives Générales, tom. x., pp. 641—665.)

Upon the propriety of employing the actual cautery in the treatment of white swelling, a procedure revived by Pouteau, Larrey, and Percy, great discrepancy of opinion prevails amongst the best Parisian practitioners. Thus, while MM. Nélaton, Guersant, and Bonnet resort to the actual cautery and other revulsive remedies, MM. Malgaigne, Chassaignac, and R. Marjolin entirely reject this means, and MM. Sédillot and Bouvier only cauterize the epidermis in the slightest possible degree. During the author's *internat* he had been struck with the fact that the only cures which took place were due to the actual or potential cautery; and since he has been surgeon to the hospital at Lisieux he has continued to derive advantage from this revulsive treatment, and especially the form of it known as transcurrent cauterization.

The disease may be considered under three stages. First, there is an inflammatory condition of one or more of the elements constituting the articulation, an inflammation that may be either simple or rheumatic, spontaneous or traumatic. The second stage is termed by Chassaignac the transition period of the disease: the white swelling is forming, and, under the influence of diathesis, the articular affection takes on a chronic form; the soft parts become engorged, and the ends of the bones enlarged, but there is as yet no articular displacement. In the third stage the white swelling is formed, and the softened ligaments have allowed of displacement of the surfaces, which have also become eroded and crepitant. Abscesses and sinuses form, and the general health completely gives way. Various degrees of this stage may be present, but the same treatment is applicable to all of these. For the treatment of the first stage all practitioners agree in prescribing antiphlogistics and repose; and it is still to the same measures we must have at first recourse in the second stage, conjoining with them the treatment appropriate for the diathesis itself. But if antiphlogistics do not soon arrest the progress of the disease, douches, iodine frictions, compression, &c., must be employed—a series of measures which, if sometimes of use, are too often inefficacious, and compel resort to be had to large flying blisters, covering the whole joint, and which, dressed with mercurial ointment, may require to be repeated from ten to fifteen times in succession. If these means fail, whether from want of due perseverance in their application or from their insufficiency, more powerful revulsives must be employed, principal among which is transcurrent cauterization, as devised by M. Bonnet and employed by M. Nélaton.

A hatchet-shaped iron is employed, having its edge blunt and its back very thick, so as to retain much caloric. Heated to whiteness, this is passed over the entire articulation, by tracing with it parallel lines which are from twenty to twenty-five millimetres distance from each other. The iron should be passed slowly three or four times in the same day, taking care not to lean too heavily, so that the skin may not be divided, while as much caloric penetrates as possible. Several irons should be in readiness, so that the operation may be performed as rapidly as possible. Chloroform should be first administered; or if the patient objects to this, a frigorific mixture should be employed, the iron in this last case requiring to be somewhat more weightily applied. When the application is finished, the joint becomes red, swollen, hot, and painful; and it is to be covered with compresses dipped in very cold water, and which, renewed every few minutes, are to be continued as long as the severe burning sensation continues. At the end of a period varying from five to twelve hours the pain is assuaged, and for the compresses may be substituted cold linseed poultices, which are to be changed every two or three hours during the first day, and three times a day subsequently. The eschars enlarge, and in from seven to twelve days become detached; and as the epidermis covering the portions of skin comprised between the rays often becomes raised, the whole surface of the joint after the detachment of the eschars is in a state of suppuration. The cataplasms can now no longer be borne, and must be exchanged for cerated dressings. The period required for cicatrization varies from two or three weeks to several months. With the local treatment should be conjoined an internal treatment by means of cod-liver oil, iron, iodine, &c., according to the exigencies of the case.

M. Notta gives the details of nine cases which have been thus treated under his care, all being undoubted examples of white swelling of a duration varying from two months to several years. The duration of the treatment varied from four and a half months to nine months; and its results were the restoration of the movements of the limbs in two cases, and cure by anchylosis in seven.

X. *Case of High Operation for Stone.* By Dr. Noeggerath. (New York Journal, vol. iv. pp. 1-24).

Dr. Noeggerath relates an interesting case of this operation performed on a boy, seven years of age, who was reduced to a most frightful condition by sufferings which had continued for years, and were attributed to inflammation of the mucous membrane of the bladder, in consequence of no stone having been detected. When examined by the author in September, 1857, the greatest difficulty was also experienced in detecting it, and it was pronounced to be a small stone situated near the posterior part of the bladder. Great was the astonishment then, on opening the bladder by the high operation, to find that organ filled by an enormous calculus, its walls being closely applied thereto, so that not a drop of urine was found in the bladder. The extraction of the stone was rendered difficult by the spasmodic contraction of the insufficiently opened bladder; and resembled, in many respects, a difficult obstetrical operation.

The only application made was a small piece of sponge, which was changed as it became drenched with urine. The reaction was very moderate, and the urine soon was freely discharged through the wound, and on the twelfth day partially by the penis. The treatment of the case was rendered difficult by its being complicated with small prostatic calculi, as afterwards discovered, and by the long continuance of the irritability of the urethra and bladder. However, all went on well eventually, the pubic wound closing up, and the bladder recovering its capacity. The stone measured two and a half inches in length, and four inches in circumference; it weighed little less than two ounces. On sawing through it, it was found to consist of three distinctly different concentric sections. The outer and thickest layer consisted of fusible calculus, together with some animal matter and carbonate of lime. The second layer was composed of a mixture of carbonate and phosphate of lime, and the nucleus was formed of urate of ammonia.

Dr. Noeggerath, after trying several experiments for the solution of stone, in imitation of those made by Dr. Hoskins, of Guernsey, came to the conclusion that the acetate of lead was the best substance to employ as an injection for the destruction of the phosphatic calculi as well as the remains of the vesical calculus that had become detached during the operation. The following was the formula employed—℞ *plumb. acet.* gr. vi.; *solve in aquæ* ℥vi., *et adde acidi acetic. fort. q.s. ad solut. perfect.* A small syringeful was injected twice a-day. "The phosphoric acid previously combined with the lime or ammonia unites with the lead, the acetic acid of which goes over to a portion of the lime or ammonia in exchange for phosphoric or carbonic acid, while the free acetic acid in the water renders a portion of the undecomposed phosphate of lime soluble." The injection acted admirably, producing the solution of the calculi without causing any pain or irritation of the urethra or bladder, and much furthering the fortunate issue of the case.

As to the high operation, Dr. Noeggerath believes that its utility has been much underrated, and that a revulsion of opinion in its favour is now taking place, both in Europe and in the United States. He thinks the fear of urinary infiltration, which has so much prevented its adoption, is imaginary; and neither the absence of distension of the bladder, or the presence of fat in the supra-pubic region, both of which circumstances were noted in this case, are contraindications. It is especially applicable to women and children, in whom, too, it is easy of execution, without injury to the peritoneum, and obviating in the former the common occurrence of vesical fistula, or incontinence of urine. The author believes that no catheter or bandage should be applied, the wound being simply covered with a clean sponge or pledget of lint; additional means rather tending to favour infiltration or the production of irritation of the bladder.

QUARTERLY REPORT ON MIDWIFERY.

By Robert Barnes, M.D. Lond.

PHYSICIAN TO THE ROYAL MATERNITY CHARITY.

I. Affections of the Unimpregnated Condition.

1. *On Atresia of the Female Genitals.* By Dr. Carl Habit. (Woehenbl. der k. k. Ges. der Aerzte zu Wien, October, 1857.)
2. *Obliteration of the Vagina, with Retention of the Menstrual Blood—Operation—Death.* By Professor Dr. Schuh. (Woehenbl. der k. k. Gesellsch. der Aerzte zu Wien, August, 1857.)
3. *Case of Total Occlusion of the Vaginal Canal for two Years—Operation—Death.* By Smith Warner, M.D. (Charleston Medical Journal, November, 1857.)

4. *Cases of Retention of the Menses relieved by Puncture through the Rectum.* By Dr. Henry Oldham. (Guy's Hospital Report, 1857.)
5. *Retro-Uterine Hæmatocele.* By Dr. Hertzfelder. (Monatschr. für Geburtsk., October, 1857.)

1. Dr. Carl Habit contributes a memoir on atresia of the vagina, illustrated by two cases, which we shall briefly analyse.

1. F. S——, aged eighteen, a healthy girl. Has suffered every four weeks for the last two years and a half, fainting, headache, fugitive heats, loss of appetite, vomiting, colicky pains in the belly, and bearing-down. During the last year she has felt a swelling in the abdomen, which has increased at every monthly exacerbation. No menstrual discharge. Examined: a tumour resembling a seven months pregnant uterus was felt reaching to umbilicus; external genitalia well-developed; the ostium vaginæ closed by a dark-blue membrane. On pressure over uterine tumour, fluctuation was imparted to this membrane. This was an example of complete atresia hymenalis. An elliptical piece was excised by scissors from the occluding membrane. The menstrual secretion flowed in large quantity; dark-red, thick, syrupy, quite odourless, like melted pitch; the quantity equalled three pounds. Some discharge, which became thin and serous at last, continued for ten days. All went well afterwards.

2. F. P——, aged sixteen, had never menstruated. For the last eight months had manifested symptoms of menstrual molimina. Examined: there was found an uterine enlargement, of size of a child's head; on account of pain, its consistency could not be determined; there was a membranous occlusion behind the rudimentary hymen; by rectum was felt a swelling, evenly rounded, strongly pressed against the sacral cavity. Operation: counter-pressure on abdomen being made, a large trocar was thrust into the middle of the distended membrane; menstrual blood followed; a canula was placed in opening, radial incisions being made to enlarge it. About a pound and a half of fluid escaped. On the third day a callous ring, scarcely admitting the index-finger, was felt in the place of the previous membrane. A plug was placed in it to dilate it; but pain caused its withdrawal; fresh incisions were made, and a cylindrical plug of gutta-percha, fixed by a bandage, was introduced. By the use of this for several hours daily, some enlargement was effected. The patient came under observation when in labour with her first child; there was no trace of the old atresia.

Dr. Habit observes that in both the foregoing cases, he found the os uteri small, not admitting the finger after the passage to it was cleared. He thinks the menstrual blood escaping from the uterus, accumulates in, and forms a pouch in the vagina. He did not find evidence of distension of the uterus proper.

2. Professor Schuh's case of vaginal obliteration. A woman, aged twenty-two, with well-developed breasts, had never had a menstrual discharge; had always been well until eleven months ago, since when she had felt every month pains and bearing-down, constipation, and swelling of the abdomen, all which subsided after ten or eleven days. Examined: the uterus, of double the normal size, was felt reaching nearly to the navel. On the left of the uterus, on the same level, distant an inch, was a second tumour, the size of a goose's egg, uneven, hard, and moveable. The external parts were normally developed. But two or three lines behind these the vagina was closed by a thick cellulo-fibrous mass, which did not yield to the finger. By rectum, was found an elastic, fluctuating swelling, the lower end of which reached as low as the sphincter, whilst the upper end could not be reached. It was ascertained that this swelling was connected with the one below the navel, which was the uterus distended with menstrual blood. The smaller tumour was supposed to

be an enlarged ovary. Professor Schuh considered the atresia to be easily divisible from its shortness. A trocar was plunged in, and the puncture enlarged in two directions. A thick, brown, meconium-like fluid escaped. The finger easily penetrated. He was astonished to find the cavity closed by a smooth yielding wall, behind which fluctuation was felt. He thought it desirable to puncture this also, and to enlarge the opening by a bistoury, so as to admit the finger. A large quantity of the like fluid escaped; and the cavity was so large, that it was impossible anywhere to touch its walls. After a few minutes it collapsed somewhat. Tepid water was injected; and linen plugs inserted in the openings. The abdomen examined, the uterus could no longer be discovered; but the smaller tumour on the left was still there. The symptoms ceased. But on the third night, the patient complained of acute pains in the belly; next day she died.

Autopsy.—The intestines were covered with a fluid resembling that evacuated by operation. The side-swelling was the left Fallopian tube, distended by menstrual blood, which could not be discharged into uterus; it had recently burst. The proper uterine cavity communicated by a large channel with the second large cavity pierced by the trocar. This latter cavity, placed immediately below the proper uterine cavity, seemed lined by a mucous membrane, and had walls resembling those of the uterus. This seemed to be formed by a distension of the uterine neck. Below this was a small opening, leading to the first cavity pierced by the trocar. This cavity was formed by the distension of cellular tissue under the pressure of the retained blood.

The cause of the rapid death was the unexpected bursting of the Fallopian tube.

3. A negress, aged twenty-two, had two years previously been delivered, after a labour of seventy-two hours' duration, of her first child. She recovered slowly, but had no return of catamenia, although there was much constitutional disturbance at each monthly period. Examined, there was found no appearance of vagina, perfect adhesions extending from the fourchette to the meatus urinarius. The uterus was full; by rectal examination, having the weight of a womb three or four months advanced in pregnancy. The operation resorted to consisted in incisions made in the track of the cicatricial tissue with the attainment of the os uteri in view. A canal was opened, seven inches in depth, but the os uteri was not exposed, nor could its exact position be determined. There seemed to be nothing but a thin distended membrane, forming a wall between the end of the finger and the fluid in the uterus, which lay at the bottom of the artificial vagina. This was punctured by a bistoury, and many ounces of dark menstrual secretion escaped. A silver canula was passed into the opening, which had to be enlarged. This opening afterwards closed up; but the artificial vagina remained open. The uterus was therefore tapped a second time. The canula, intended to be left in the new opening, however, slipped out; the trocar was introduced again, with a view to the replacement of the canula. During this attempt a sudden motion of the patient, and excessive pain, made the operator fear that the trocar had passed through the uterus. The poor woman died of peritonitis on the third day. No post-mortem examination was made.

This case forcibly illustrates the difficulties and perils of the operation for establishing a new vagina, and restoring the natural channel for the catamenia, in cases of extensive adhesions. It is probable that Dr. Oldham's operation of puncture through the rectum might have succeeded.

4. Dr. Oldham's cases have already been adverted to in the analysis of the Guy's Hospital Reports; we would, however, add that the simplicity, safety, and success of his operation of puncturing through the rectum cannot fail to ensure for it a preference over attempts to make a new vagina, in most cases of congenital and cicatricial closure.

5. M. St. ——, eighteen, had enjoyed good health; suffered from irregular menstruation; was admitted into hospital complaining of acute pains in the rectum and sacral region, only allayed by rest in a horizontal position. Examination revealed a round, somewhat tense, painless swelling, stretching from the pelvic brim to midway between ensiform cartilage and umbilicus. It was about seven inches wide, and lay rather more on the right side. Vaginal examination through the dilatable hymen, revealed a conical swelling, with the apex downwards, quite filling the right pelvic half, and narrowing very much the vagina. The meatus urinarius was drawn up under the pubic arch. This swelling was tense, distinctly fluctuating; its surface smooth, and at the lower end ulcerated. By pressure from without inwards, the swelling was moveable. The uterus could not be reached by the fingers. The absence of previous inflammation, the mobility of the tumour, the youth and strength of the patient, excluded abscess, caries, and carcinoma, also fibrous tumour of uterus and ovarian cyst. There only remained the probability of a uterine hæmatocele; that is, a menstrual effusion of blood into the cellular tissue around the uterus. Puncture verified this diagnosis. About a pound of tenacious, dark-red blood was evacuated, after which the patient quite recovered, so that at the end of four months no fresh excretion was observed.

II. PREGNANCY.

1. *Graviditas Ovarii.* By C. W. F. UHDE. (Monatsschr. f. Geburtsk., Nov., 1857.)
2. *An Extra-Uterine Pregnancy, lasting Thirty-three Months.* By Dr. DIAMANTOPULOS. (Monatsschr. f. Geburtsk., Nov. 1857.)
3. *Case of Fallopian Pregnancy, resulting in Rupture of the Cyst, and terminating in Death.* By Dr. R. P. HARRIS. (Amer. Journ. of Med. Sc., Jan., 1858.)

1. A healthy married woman, aged nineteen, had borne two children, after easy labours. On the 13th June, 1857, after lifting a heavy weight, she suffered very acute pain in the region of the liver. She became pale, fainting, cold. On the 15th the pulse was 120. It was ascertained that the menses had last appeared ten weeks ago, but she did not suspect pregnancy. On the 17th the patient got about, but painfully; on the 18th about two table-spoonsful of coagulated blood escaped by the vagina; on the 19th she was pale as a corpse, almost breathless, pulse small, 120 to 135. The symptoms of internal hæmorrhage were clear. The diagnosis was undecided between rupture of the liver and rupture of an extra-uterine pregnant sac. She died on the 21st. The liver was found healthy. Recent adhesions in the abdomen, forming a cavity, enclosing two pounds of dark, fluid blood. At the bottom of this cavity was seen the enlarged right ovary, at the posterior and under part of which was a sac lined with chorion, which had burst. This was of the size of a plum; in it, besides some dark blood, was an embryo about seven or eight lines long, resembling a kidney-bean, and surrounded by the umbilical vesicle and villi. The right Fallopian tube hung free in the abdominal cavity, was filled with plastic lymph, and was permeable by a fine silver sound from the fimbriated end for three-and-a-half inches, to a point where it was closed up. The uterus was about three inches broad, and four inches long, and had the appearance of the second month of gestation; the walls were thickened, the membrana decidua was completely formed, and stretched into the orifices of the tubes, which had the calibre of a large crow-quill.

2. A girl, aged seventeen, first menstruated at twelve years nine months old, married at thirteen, aborted soon after, and conceived again. At the time of conception (in December, 1853) she experienced many troubles, and received

a blow from a fist on the abdomen. At the end of the term of gestation pains set in, which disappeared in four days. In the fifteenth and sixteenth months menstruation returned, and then an illness, probably a light typhus. When examined, a fœtal head was felt above the navel; the uterus, bent backwards in the pelvis, appeared slightly enlarged and empty. The patient rejected an operation. In August, 1855, an intense erysipelas appeared on the abdomen, and soon after two fistulous openings in the navel, out of which flowed a sanious discharge, and, six months later, hair. The abdomen grew less, and exploration with sounds revealed a decomposing fœtus. On the 25th September, 1856, the fistula was enlarged by a crucial incision, and the separate bones were gradually extracted. The patient lay in a precarious state for some time, but gradually she recovered. The cyst contracted; the fistula closed in December; the menses reappeared.

3. Dr. Harris's case of Fallopian pregnancy. Mrs. S——, aged twenty-seven, mother of an infant a year old, being apparently in perfect health, was suddenly seized with excruciating pain in the lower abdomen, and faintness, followed by collapse. Death took place in twenty-one hours.

Autopsy.—The cavity of the pelvis, as well as the lower and back part of the abdominal cavity, was filled with black blood, partly fluid, partly coagulated. The uterus was scarcely enlarged beyond the size of women who have borne children. Its cavity contained a little mucus, slightly tinged with blood, but no trace of a decidua; the ovaries were healthy, of normal size, very pale in colour (anæmic). In the right Fallopian tube, immediately above the ovary, was a tumour of an oval form, slightly flattened antero-posteriorly, about 1·25 inch long, one inch in vertical diameter, and of a reddish blue colour. A small opening, of a little more than a line in diameter, was detected at its upper surface, perforating the edge of the broad ligament. This tube communicated with the peripheral portion of the body, but not with its interior cavity. An incision made through the cortical portion, so as to divide the body to its centre, revealed a cavity containing a small diaphanous sac, within which was an embryo of a pure white colour, ·50 inch long, looking a good deal like a common maggot. The ovum was supposed to be of about three or four weeks' gestation. The patient was menstruating at the time of the fatal rupture.

[A point of interest in the case, as bearing upon a much disputed question, is, the recorded absence of "membrana decidua" in the uterus. This question appears to the Reporter to turn upon the question, What is the "membrana decidua"? If we conclude with Hunter, that it is a new plastic substance thrown out like the false membrane in croup, then, indeed, we need not be surprised at failing to find it in a uterus one month after conception. And if we look upon it in its true light, as the developed mucous membrane of the uterus itself, then, also, we need not be surprised at not finding, at so early a stage, anything more than mucous membrane, as yet too little altered from its usual appearance to strike the observer as a distinct membrane. The search is for a hypothetical entity, therefore the search fails. Seek for the real entity; it will be found.—REPORTER.]

III. LABOUR AND PUERPERAL STATE.

1. *A Case of Epilepsy in a Pregnant and Puerperal Woman.* By PROFESSOR HOHL. (Monatsschr. f. Geburtsk. October, 1857.)
2. *Starvation of an Infant from Paralysis of the Facial Nerve.* By PROFESSOR HOHL. (Loc. cit.)
3. *A Case of Incision of the Labia Majora, with Rupture of the Perinæum.* By PROFESSOR HOHL (Loc. cit.)
4. *A Case of Adherent Placenta: Pyæmia: Death.* BY PROFESSOR HOHL. Loc. cit.)

1. Professor Hohl's case of epilepsy in a pregnant woman is interesting. Auguste K., aged thirty, of a healthy family. In her fifteenth year first menstruated. The catamenia appeared only three times this year. In her sixteenth year, after a violent heat in the summer, she was seized with her first epileptic fit. From this time the fits returned regularly every two or three weeks, but did not appear to stand in relation to the menstrual periods. Several months prior to her delivery it was apparent that, through the oft-repeated epileptic attacks, her mental functions had been impaired—her memory especially had suffered. During pregnancy, the fits had neither increased nor diminished. Received into hospital, the fits soon showed themselves; they were clearly epileptic. The face became much congested; the lips and eyelids were œdematous, the pupils without sensibility. No albumen was ever found in the urine. The fœtal pulsation was heard; up to this time the fits had no effect upon the life of the child. It was remarkable that as the period of delivery neared, the fits increased decidedly in frequency. Five days before, two violent attacks; the next day, three. After the third day the condition in the intervals was quite changed. The patient no more recovered her mental or bodily strength. The cervix uteri was now nearly effaced. The head was freely moveable on the pelvic brim. As the fits now reacted injuriously upon the mother, delivery was determined upon. The uterine douche was used every two hours for fifteen minutes. After the sixth application, contractions began; but these ceased and convulsions returned. Bleedings, by cupping to the neck, and leeches to the head, had no influence in assuaging the symptoms. Cold affusions to head were used, and had the good effect of producing a quiet sleep through the night. Next morning labour-pains returned every quarter of an hour, and the os uteri expanded. On the following morning the liquor amnii escaped; a rather severe flooding ensued, which ceased during the expulsion of the child. The child was still-born. The placenta came in fifteen minutes. Immediately after the birth, another fit seized her, less intense than the preceding. Shortly afterwards, the body was convulsed every four or five minutes by strong electric-like shocks, which, after some hours, ended in death through coma.

Autopsy.—The brain was very soft. The pia mater was easily detached, a little thicker than natural; between the membranes some clear serum; in the ventricles a tablespoonful of clear fluid. The skull was in places, especially on the frontal bone and on either side of the coronal suture, thinned and transparent; on the frontal bone were small puerperal osteophytes. In the rest of the body, particularly in the kidneys, the most careful microscopical examination discovered nothing abnormal. [This case is an example of puerperal convulsions, with œdema, and without albuminuria. In this country the attempt to deliver would have been commenced earlier, and persevered with resolutely, either by turning, forceps, or craniotomy. By one of these means the labour would probably have been effected thirty-six hours sooner. Would the mother have been saved? She would at least have had a better chance.—REPORTER.]

2. Professor Hohl has related, in his Report of the Lying-in Hospital at Halle, a case in which the death of a new-born child was brought about in a very unusual manner. A woman in whom labour was arrested, through complete absence of uterine contraction, was delivered by the forceps, the head lying in the pelvic cavity. In consequence of the pressure of the left blade of the forceps, there resulted a paralysis of the facial nerve of the left side, which resisted all treatment. By this the infant was hindered from suckling, since all the milk ran out of the corner of the mouth on the paralysed side. Everything, prior to being swallowed, had to be placed within the grasp of the muscles of the pharynx. The child was thus gradually reduced by atrophy, and died on the twelfth day

3. In a previous report, we gave an account of Professor Scanzoni's proposed

method for preventing the laceration of the perinæum in difficult labour, by making incisions in the labia majora. In a case in which this operation was resorted to by Professor Hohl in the Lying-in Hospital at Halle, although five incisions were made, the perinæum was torn notwithstanding. The incisions, says Hohl, had no other advantage than making so many wounds the more.

4. A case recorded by Professor Hohl shows that in certain cases of adherent placenta, complete extraction is impossible or dangerous; it also illustrates the consequences of this accident. A patient in the Halle Lying-in Hospital, delivered of an immature fœtus, was seized immediately afterwards with violent flooding. Attempt being made to extract the placenta, it was found that about three-fourths of it adhered to the uterus. It was about half detached, when the patient suddenly moved so strongly that the hand grasping a portion of the placenta was thrown out of the uterus and vagina. As the patient would not permit another attempt and the flooding went on increasing, chloroform was administered. On examination, it was now found that the os uteri was closed by spasm, effectually preventing the passage of the hand. Nothing but small fragments, thickly studded with chalk-concretions, could be extracted. On the following day, a purulent, horribly offensive discharge began, and a strong shivering fit, followed by heat and sweat, appeared. This was repeated on the second night, and again on the third. Collapse followed, with unquenchable thirst, severe headaches, dry tongue, delirium—in short, all the symptoms of pus-poisoning. On the fourth day there appeared, for the first time, pain on pressure in the left side; this increased with the exacerbation of the other symptoms. She died on the eleventh day, having first exhibited raging, subsiding into muttering delirium. Death set in with peculiar electric-like shocks.

Autopsy.—Considerable purulent exudation in the abdomen, and adhesions. In the uterus was a completely calcified piece of placenta the size of a walnut, intimately united with the uterine wall. The blood in the body was cherry red, and nowhere coagulated.

MEDICAL INTELLIGENCE.

The University of Oxford and Medical Students.

A LETTER by Mr. Pearson* to the Provost of Oriel has recently gone through two editions, in which it is proposed to offer certain facilities to medical students who wish to take their degree at Oxford. It has always appeared to us a strange anomaly that the most liberal of the professions should be almost ignored by the two largest universities of England, and that medicine should be left to shift for herself, in the pursuit of truth, while she so especially requires that *otium cum dignitate* for the prosecution of scientific research which the fostering influences of a rich university can bestow. We will not say that the science of medicine has thriven the worse for the neglect, but she has had to fight harder battles to secure her recognition by the State than would have been otherwise necessary, and quackery has been more rampant because the comparative exclusion of medicine from the universities has allowed gentlemen to become erudite classical and mathematical scholars without imparting to them an inkling of the logic of nature. While we rejoice that there is a prospect of English medical men becoming associated with their own universities, instead of being driven to other countries to obtain university distinction, we do so quite as much because we believe that the universities will gain as that medical students will profit. In fact, in order to secure a large accession of medical students to Oxford, it will be necessary not merely to diminish the period of residence, but to insure the means by which the student may go through his medical curriculum as completely and as satisfactorily at Oxford as at a London school. It appears to us an error to suppose that a small town is unfitted for a medical school. We would wish to see all medical schools transferred to small towns, because in them alone can there be that control over the young men, and that intercourse between pupil and professor which is one of the main elements in beneficial instruction. The opposing argument, that large hospitals are necessary, and cannot be supported in small towns, falls to the ground at once if we look to the comparative merits of some British and foreign schools. Many might be named that have been the cradle of great professional men, which do not boast of what are commonly called large hospitals. The principle itself is mistaken: the student is bewildered in large hospitals. It is much better for him that he should study diseases in a few well-marked cases, which will abide in his memory as types for comparison throughout his career, than that he should walk the hospitals in the desultory manner that yet prevails. It is not the hospital that makes the eminent student, but the professor; and, without drawing invidious comparisons with other professions, we may with pride point to the many distinguished names that adorn the roll of medical science who, without being supported by patronage or powerful aid, have succeeded in diffusing the greatest benefits of sanatory and sanitary science among their cotemporaries. But the system cannot be a just one which compels every votary of science to regard her only as a means to an end. It is most desirable that there should be some well-endowed professorships to which men of great ability may aspire, and which may enable the holder to devote himself exclusively to scientific pursuits, without the benumbing cares of earning the daily bread. The practical character of the English practitioner will doubtless always belong to the body of English medical men; but the crudities of empiricism may be softened down, and the general character of the mass of practitioners be elevated, by contact with other minds and by the consciousness that their science takes an acknowledged and equal place with the liberal professions.

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* A Letter to the Provost of Oriel on a Scheme for making Oxford more accessible to Medical Students generally. By C. H. Pearson, M.A., Fellow of Oriel College, and late of St. George's Hospital. London, 1858.

We have not space to enter into the detail of the proposals embodied in Mr. Pearson's interesting pamphlet. We only wish most cordially to assent to the general doctrine involved in his plan—that medicine should be duly represented at the ancient English universities. But we go further than Mr. Pearson and his friends, for we think that, by a slight extension of their plan, the benefits of a university education may be more fully secured to the medical student, and that, by encouraging and enabling him to go through his entire curriculum at the university, he will be in every way fitted to avail himself subsequently, if he have the spare time, of the greater opportunities of observation in the metropolitan hospitals. To the majority of London students this wealth now lies hidden; it remains not only unexplored, but unintelligible, though it is open to their eyes, because they do not possess that careful training which a London medical school can scarcely afford them. Let Oxford continue in the path of enlightened reform which she has recently entered upon, and we look forward with great confidence to an advancement of medical science hitherto unknown. That there will be crowds of young men able and willing to avail themselves of the opportunities offered them we do not hesitate confidently to affirm.

The Main Sewage Question.

Before entering upon the enormous expenditure which the great sewage-nterception works would entail upon the metropolis, it is clearly desirable that the sanitary necessity of such a step be ascertained. We belong to those who think that the maintenance of the public health merits any expenditure necessary to secure it. Still, in paying our money, we should wish to be assured of a certain return; and it is at least doubtful whether sufficient proof exists that the present system of discharging the contents of the sewers at different points into the Thames is productive of the injury to the public health which is the main argument for the necessity of the main drainage system. In the quarterly and annual reports of their medical officer of health, Dr. Barnes, recently issued by the vestry of Shoreditch, it is argued by the author, that the state of the health of those who live on the Thames and on its shores does not prove the river to be pernicious. Dr. Barnes observes that if the theory be true that the river exercises a deadly influence, it should be traced—1, in the severest degree, amongst those who live on its waters; 2, in those who dwell near its shores; and 3, that we ought to find comparative immunity from fever and diarrhœa amongst those who live at a distance from the river. Dr. Barnes maintains that the evidence on these points is wanting, while he calls attention to an illustrative fact, that "since the replacement of the old 'Dreadnought' by the present ship, now nine months ago, not a case of fever has originated on board this floating hospital." If fever be a test of prevalence and concentration of miasm, this fact has a strong bearing upon the question at issue.

While Dr. Barnes evidently tends to the belief that the main sewage plans are based on an error in principle, he admits that the "bed and banks of the Thames urgently need improvement, but on other grounds than that of increasing the self-purifying capacity of its water." He asks that the works necessary to insure these improvements be first carried out, and expresses his conviction that it will be time to consider further remedies when it is proved that these are insufficient in a sanitary point of view. We fear that, by adopting such a proposal, we should, if after all the main sewage system be found necessary, only be postponing, and thus enhancing, the difficulty. Our own opinion is, that there is great danger in limiting the discharge of the sewage of a town like London to one or two emunctories. The risk of a derangement in their working would be indeed great, as there would be no safety-valves by which an arrest in the discharge could be rendered innocuous; this, however, is a different view of the question from that proposed by Dr. Barnes. That a further inquiry into the sanitary evidence bearing upon the case is necessary cannot be doubted, and for this reason we bring Dr. Barnes' reports specially to the notice of our readers, though without pledging ourselves to support them.

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